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TROPICAL DISEASES BULLETIN

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Vol. 2. 1913. No. 2.

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 2.] 1913. [No. 2.

LEPROSY.

KUPFFER (A.). **Die Lepra in Estland.** [Leprosy in Esthonia.]—*Lepra.* 1913. Apr. Vol. 14. No. 1. pp. 14-32.

Leprosy was prevalent in Esthonia (the most northerly of the Russian Baltic provinces) in the Middle Ages, but apparently died out again in the 17th and 18th centuries. It had reappeared by the second decade of the 19th century, probably introduced by Cossacks from the South during the Napoleonic wars, but made little progress until the period succeeding the Crimean war; and Kupffer brings forward good arguments in support of his contention that the increased prevalence is due to the occupation of the province at that time by troops from infected districts of the South. Later opportunities for infection occurred through the return of natives after military service, and the increasing communications of the remoter districts with other parts of Russia. The total number of lepers recorded since 1828 is only 350, and at the present time there are outside the asylums only 30 known lepers among the 467,000 inhabitants of Esthonia. Since 1906 at least one third of all the lepers alive in Esthonia have been isolated in the official asylums, and about seven-tenths are so cared for at present. An account is given of the official regulations and the means adopted for the notification and control of cases as they occur.

J. Henderson Smith.

MEULENGRACHT (E.). **Communication concernant la Lèpre en Serbie.**—*Lepra.* 1913. Apr. Vol. 14. No. 1. pp. 33-34.

An account of a case of lepra mixta in a young man, whose father and elder brother suffered from the same disease. The interest of the case lies mainly in the fact that hitherto only 3 cases of leprosy have been recorded in Servia.

J. H. S.

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Serra (Alberto). **Lo Stato attuale della Lepra in Sardegna.** [Leprosy in Sardinia at the present time.]—28 pp. With 2 plates. 1912. Cagliari: Prem. Stab. Tipogr. Ditta G. Dessi.

A pamphlet giving the history of seven cases recently observed in Sardinia, and illustrating the much greater prevalence of leprosy than is officially recognised, and the necessity of energetic measures and constant watchfulness on the part of the officers of health.

J. H. S.

Zambaco. **La Lèpre dans l'Égypte actuelle.** — *Presse Méd. d'Egypte.* 1913. Mar. 15. Vol. 5. No. 6. pp. 89-92.

The number of cases of leprosy actually registered in Egypt is 2,204, but Engel, Director of the Statistical Department, estimates that there must be 8 or 9 times that number in the country. These cases mingle freely with the general population, follow every trade, and are in intimate contact with their families and neighbours. But no single instance of direct contagion has been conclusively established in Egypt, and no foreigner has contracted the disease in the country. Zambaco, laying emphasis on these facts, insists that it is impossible to look on leprosy as a contagious disease in Egypt, since every opportunity is given for the infection to spread, and without offering an alternative explanation of its persistence maintains that it is unscientific to uphold the contagion hypothesis in the absence of any direct evidence of its occurrence.

J. H. S.

Eichmuller (G.). **Réflexions à propos de deux Cas de Lèpre observés à Tunis.**—*Lepra.* 1913. Apr. Vol. 14. No. 1. pp. 35-39.

Eichmuller records the occurrence of a case of ulcerative tuberous leprosy, of which the mother was found to be suffering from the disease, while two cousins had already died from it. The connection between these four cases is not satisfactorily established, but Eichmuller considers that the mother was infected from the son, and that they are good evidence of the contagious nature of leprosy. He draws attention to the necessity of regulations for the control of leprosy in Tunis.

J. H. S.

McCoy (George W.). **Care of Lepers in Hawaii.**—*U.S. Public Health Rep.* 1913. Apr. 18. Vol. 28. No. 16. pp. 726-728.

There is a prevalent impression that the lepers in Hawaii are kept isolated on a barren island with armed guards and under conditions of extreme severity. As a matter of fact the leper establishment is situated on a small peninsula of the beautiful island of Molokai, there are no armed guards, and the patients are so contented as to show no wish to leave the settlement. The

disease was introduced some 60 years ago, probably by Chinese, and since 1864 a policy of segregation has been carried out. Anyone who knows of a case of leprosy in the islands is required to report it, and if on examination the suspect is found to be infected, he is committed to an isolation hospital at Honolulu, where he is treated for at least 6 months. If no improvement occurs in that time, he is removed to the Molokai settlement. There the patients are well cared for, marriage is allowed, children being removed to healthy surroundings, and ample food and clothing and medical attendance are provided. At present about 700 lepers are known to exist in the islands, 600 at Molokai and 100 in the isolation hospital at Honolulu, but there must be many more not reported. The number is decreasing, since the native Hawaiians who are the principal sufferers are becoming rapidly fewer. The Government is fully alive to the importance of the question, and the tax on the Hawaiian treasury for the care of lepers alone amounts to about 1 dollar per head of the entire population.

J. H. S.

Clinical.

Brocq, Fernet, & Delort. **Lésions Ulcéreuses Gangréneuses et Phagédéniques chez un Lèpreux.**—*Bull. Soc. Française de Dermatol. et de Syphiligraphie.* 1913. Feb. Vol. 24. No. 2. pp. 57-69.

An account of a case of lepra tuberosa, which developed on the left leg several livid red patches which turned rapidly dark and eventually ulcerated. They became gangrenous, sloughed, and finally the ulcer that remained extended in the manner of phagedenic ulcers, which indeed they closely resembled. The process eventually ceased, and slow healing began. The condition is not unlike that which has been described as *lepre lazarine*, but the authors found no evidence to assure them that its occurrence was directly due to the leprosy bacillus.

[The subsequent discussion on this paper illustrates the difficulty of determining the prevalence of leprosy, since there was considerable difference of opinion as to whether 50 or 500 was nearer the actual number of lepers in the Department of Alpes-Maritimes.]

J. H. S.

Carrieu (M.) & Anglada (J.). **Hépatite Lèpreuse à forme de Cirrhose Ascitique Biveineuse avec Présence de Bacilles de Hansen dans le Parenchyme Hépatique.**—*Arch. de Méd. Expérimentale et d'Anat. Pathologique.* 1913. Mar. Vol. 25. No. 2. pp. 149-167. With 4 text-figures.

The case, which is described in detail with illustrative sections of the liver, is one which had presented evidence of leprosy for a little more than 2 years, but came under the observation of the authors owing to marked signs of ascites that had been apparent for about 2½ months. This was not accompanied by any signs of peritonitis and was eventually shown to be due to extensive interstitial cirrhosis of the liver in both the portal and subhepatic areas,

producing a mechanical obstruction. Clinically there were quite definite signs of nodular and macular leprosy, but the bacilli could not be found in the nasal mucosa during life, nor were they found post mortem in any organ except the liver. There, however, they were present in enormous numbers typical in grouping, staining and other characters and not producing any lesions in guinea-pigs. Leprosy of the liver is a comparatively rare condition, usually met with only in general invasion of the viscera and accompanied by amyloid degeneration without a definitely specific local reaction. Occasionally a nodular form is met with or a diffuse interstitial change, which is more specific, but cirrhotic forms are rare, more particularly when the bacilli are present in large numbers. In this case there was undoubtedly some parenchymatous hepatitis, but the prominent change was the cirrhosis, which recalled the typical Laennec cirrhosis in its anatomical appearance and clinical effects. Nowhere else, except in the skin, was there any definite specific change; and the authors suggest that a tendency to alcoholism in the patient had determined the localisation of the lesions in the liver.

J. H. S.

Treatment.

Serra (Alberto). **L'Antileprol nella cura della Lepra.** [Antileprol in the treatment of Leprosy.] — *Gior. Ital. d. Malatt. Veneree e d. Pelle.* 1912. Vol. 53. (Anno 47.) No. 6. pp. 734-738. With 2 plates.

Serra has treated 10 cases with antileprol, a preparation derived from chaulmoogra oil, and is greatly impressed with its efficacy. It is so much better tolerated than the oil that it is possible to give high doses, and he has given as much as 10 grammes per day to one case by the mouth, 5 gm. twice daily subcutaneously to another case, and to a third 5 gm. subcutaneously and up to 4 gm. by the mouth, without producing any renal or alimentary disturbance. Four of the ten cases were treated for over 3 months and two for 6 months, and all six were greatly improved. They comprised 3 cases of lepra tuberosa, 1 of lepra mixta and 2 of lepra nervorum. Ulcers dried up and healed, lepromata were absorbed, laryngeal and nasal signs disappeared, thickening and swelling of arm and hands were reduced, bacilli lost their staining uniformity and many disappeared; even in the anaesthetic cases there was a considerable return of sensibility. Serra recognises that the improvement may be only temporary, but he looks on antileprol as the only specific remedy we have at present for the cure of leprosy.

J. H. S.

Brocq & Pomaret. **Nouveau Produit injectable pour le Traitement de la Lèpre.**—*Bull. Soc. Française de Dermatol. et de Syphiligraphie.* 1913. Feb. Vol. 24. No. 2. pp. 70-73.

Jeanselme (E.). **A propos de la Communication de MM. Brocq et Pomaret sur un Nouveau Produit injectable pour le Traitement de la Lèpre.**—*Ibid.* Mar. No. 3. pp. 149-150.

Oil of eucalyptus (5 or 10 per cent.) has been injected with benefit, it is said, in leprosy; and it was pointed out by Pomaret that

if 30 cc. be added to 70 cc. of chaulmoogra oil, which has been rendered fluid by warming, the mixture remains fluid at all temperatures, and can be bottled and sterilised ready for injecting. The mixture is tolerated much better than pure chaulmoogra oil. Jeanselme uses a mixture consisting of Chaulmoogra oil (washed in alcohol and filtered), 20 gr.; Guaiacol, 1 gr.; Camphor, 0·50 gr.; Vaseline oil pure, 20 gr.

J. H. S.

Gaucher & Boinet. **Traitement de la Lèpre par les Injections Intraveineuses de Salvarsan et les Piqûres d'Abeilles.**—*Bull. Soc. Française de Dermatol. et de Syphiligraphie.* 1913. Mar. Vol. 24. No. 3. pp. 172-174.

A brief account of a case of lepra tuberosa with symptoms of 18 months' standing, which was treated daily for 40 days with bee-stings, in numbers which were gradually increased up to 150-200 (in all 3,935 were given), and also received 40 cgr. of Salvarsan. The result of this treatment seems to have been on the whole favourable, numerous ulcers on limbs, feet, hands &c. drying up and cicatrising quickly, and lepromata on the face, ears &c. atrophying but not disappearing completely.

J. H. S.

Experimental.

Serra (Alberto). **Dernières Recherches sur l'Inoculation de Matériel Lèpreux dans l'Oeil du Lapin.**—*Lepra.* 1913. Feb. Vol. 13. No. 4. pp. 237-247.

Serra has already published the fact that he has isolated from developing lepromata a bacillus which corresponded completely to the anaerobic organism isolated by Campana and later by Ducrey, and has given an account of his attempts to transmit the disease to animals. He found that the inoculation of the culture into the anterior chamber of the eye in rabbits was followed eventually by a nodular development indistinguishable from a leproma, while the serum of the animals developed the properties of agglutination and complement-fixation possessed by the serum of human lepers. Further, it was possible to produce nodules in fresh rabbits with material from animals previously injected. In this paper he reproduces a series of photographs illustrating the changes which occur in the anterior chamber after inoculation with normal skin, with young lepromata, with nodules from rabbits, and with culture material. No significant difference is apparent in the lesions of the series injected with culture or infected tissue, and multiplication of the organisms occurs; while in the animals injected with normal tissue the material injected eventually disappears. He has succeeded in isolating again from an experimental nodule the organisms injected, and with this bacillus has again produced nodules in fresh rabbits. He has not yet succeeded in isolating the bacillus from nodules produced by the injection of leproma tissue, a result which would go far to establishing the fact of the multiplication of the bacilli.

J. H. S.

Möllers (B.). **Serologische Untersuchungen bei Leprösen.** [Serum-reactions in Leprosy.]—*Deut. Med. Wochenschr.* 1913. Mar. 27. Vol. 39. No. 13. pp. 595-596.

The capacity of leper-serum to fix complement in the presence of tubercle bacilli or of extracts made from them was tested with 32 sera. These came from various parts of the world (*e.g.* Japan, Egypt, Carpathia) to Berlin, and were not fresh; but the author found that the complement-fixing power, if present, remained intact for months, and even spontaneous deviation occurred only after 6-12 months' keeping in the Frigo apparatus. Of the 32 sera 20 were derived from cases of lepra tuberosa, and 19 or 95 per cent. of these gave positive results; 4 from lepra mixta with 100 per cent. positive results; and 8 from lepra nervosa with 25 per cent. positive. The negative tuberosa case was one which had been regarded as healed for 3 years and no longer gave a Wassermann reaction. Four preparations of tubercle were used in the experiments, viz. Old Tuberculin, New Tuberculin T. R. (Hoechst), Perlsucht Tuberculin (Hoechst), and a preparation of the bacilli similar to T. R. known as T. O. I. The two bacillary preparations gave better results than the others, which are culture-fluid preparations, and bovine tubercle appeared to give a more effective antigen than human. The author has little doubt that the high percentage of positive results points, not to a concomitant tuberculosis in the patients from whom the serum was derived, but to a group-reaction or relationship between the tubercle and the leprosy bacilli.

J. H. S.

Gougerot (H.). **Anaphylaxie Lèpreuse.**—*Lepra.* 1913. Feb. Vol. 13. No. 4. pp. 211-217.

Gougerot states that Rost's leprolin produces on injection into lepers a local and general reaction analogous to the tuberculin reaction and not obtained in normal individuals; and that it has a distinct curative action—in fact that "treatment with leprolin is the best treatment we know of." There is a leprous anaphylaxis in the same sense as there is a tuberculous anaphylaxis, and he has twice demonstrated passive sensitisation of guinea-pigs by injecting them intraperitoneally with leper serum and afterwards injecting leprosy bacilli intracerebrally. Lepers will sometimes give a general reaction to tuberculin, and in two cases out of four he obtained an intense local reaction when the cuti-reaction was made with tuberculin over a leproma. The ophthalmo-reaction was always negative. Conversely, in cases of lupus and pityriasis rubra subcutaneous injection of 5 cc. of leprolin may produce a general reaction, although positive results were not obtained with ophthalmo- or cuti-reactions. He has twice out of 6 experiments demonstrated passive sensitisation by injecting tubercular antigen intracerebrally into guinea-pigs previously treated with leper serum, and 10 times out of 24 by injecting leprous antigen into guinea-pigs injected with tuberculous serum. Gougerot believes that the local anaphylactic state explains many difficult clinical problems, and our knowledge of its existence will help us in prophylaxis and treatment.

J. H. S.

Unclassed.

Montesantos (Denis). **Un Coup d'Oeil sur la Question de la Contagiosité et l'Hérédité de la Lèpre.**—*Presse Méd. d'Egypte.* 1913. Apr. Vol. 5. No. 7. pp. 105-106.

The author in some speculative observations on this subject remarks firstly, that in many cases of leprosy there is a long period of latency, broken only by isolated and transitory symptoms, before the disease definitely declares itself, and this long interval frequently makes it impossible to trace the source of the infection; secondly, that the geographical distribution of leprosy has no relation to climatic or hygienic conditions; and thirdly, that among the less severe anaesthetic types of the disease cases occur which are really mild and may be looked on as attenuated forms of the disease. These latter, he asserts, occur only in regions where the disease has long been endemic, and are due to a partial immunity acquired by the remote descendants of lepers. There is thus a graduation in susceptibility to infection. He admits the occurrence of direct contagion, but considers that an individual who is attacked by the bacillus loses his power of resistance gradually during the long latent period, and this diminished resistance or increased susceptibility may also be transmitted to his descendants.

J. H. S.

Barbézieux (G.). **La Prophylaxie de la Lèpre au Tonkin. (Réponse à quelques Objections et Critiques.)**—*Bull. Soc. Méd.-Chirurg. de l'Indochine.* 1913. Mar. Vol. 4. No. 3. pp. 88-97.

Some remarks on the methods and objects of the system adopted for the treatment and care of lepers in Tonkin.

J. H. S.

Thompson (J. Ashburton). **Experimental Leprosy: a Perspective.**—*Lepra.* 1913. Apr. Vol. 14. No. 1. pp. 1-13.

A review of some of the recent work on the bacteriology of leprosy, in which the identity of the organism isolated by Kedrowsky with the chromogenic bacterium cultivated by Duval is taken as assured. [No reference is made to the work of Bayon on the subject.]

J. H. S.

Favre (Maurice) & Savy (Paul). **Histologique Pathologie du Léprome cutané aigu.**—*Arch. de Méd. Expérimentale et d'Anat. Pathologique.* 1913. Mar. Vol. 25. No. 2. pp. 225-232. With 1 plate.

A detailed description of the histological appearance of a nodule removed in the acute stage of development. The authors uphold the existence of a genuine lepra cell, which they regard as a connective tissue cell and of great importance in the formation of the nodule.

J. H. S.

PLAGUE.

Low (R. Bruce). **Preliminary Statement as to Occurrences of Plague and Cholera throughout the World during 1912.**—*Reports to the Local Govt. Board on Public Health and Medical Subjects.* 1913. (New Series No. 78). pp. 22-33. (London: published by H.M. Stationery Office.)

This information was given in tabular form in Vol. 1, p. 557, of this *Bulletin*. In India there were more than 273,000 deaths from plague in the year 1912, compared with 842,000 in 1911. There is a population of 48 millions in the United Provinces of Agra and Oude; 158,074, 332,301, and 101,229 are the numbers of fatal cases recorded there in the years 1910, 1911, and 1912. The figures for the Punjab with a population of 24 millions are 169,867, 198,000, and 30,000 for those years. The Presidency of Bombay with a population of 27 millions had 100,399 deaths from plague in 1911, and about 32,000 in 1912. In Madras with its 46 million inhabitants, there were only 6,500 deaths from plague in 1912. Assam and the North West Frontier Province were almost entirely immune. During 1912, 1,708 deaths from plague occurred at the port of Bombay, 1,828 at Calcutta, 1,110 at Karachi, and 852 at Rangoon.

Hongkong suffered severely—1,729 deaths; there was an epizootic among rats at the same time. At Shanghai the rats were infected without an epidemic arising.

C. Birt.

Epidemiology.

Swellengrebel (N. H.). **Mededeeling omtrent Onderzoekingen over de Biologie van Ratten en Vlooien en over andere Onderwerpen, die betrekking hebben op de Epidemiologie der Pest op Oost-Java.** [Investigations on the Biology of Rats and Fleas, and on other Subjects relating to the Spread of Plague in East Java.]—*Geneesk. Tijdschr. v. Nederlandsch-Indië.* 1913. Vol. 53. No. 1. pp. 53-154. With 15 pages of charts and curves.

In the year 1910 plague broke out in the Province of Malang, a mountainous district, situated 400-1,000 metres above sea-level in the eastern part of the Island of Java. In a population of about three quarters of a million there were about 1,500 people attacked in 1911, and 2,240 in 1912. 753 cases have already occurred this year, and the disease has extended to the neighbouring provinces of Kedirie and Madioen with a population of about 40,000 where over 1,200 attacks have been already reported, and it is still raging. A curve of plague incidence is given in which it is seen that there was a sudden rise in May, 1911, and a sudden fall in July and August; after remaining low from October, 1911, to April, 1912, it began to rise again and is still on the up grade. The climate is very uniform; the humidity does not fall below 70 per cent. of saturation; the temperature remains at 23°-25° C. throughout the year.

Rats.—The most widely distributed species of rat in Java is the *Mus rattus*, of which there are two varieties, the house-rat and the

field-rat; the former differs from the latter in its variable colour, in its tail being longer than the body, and in possessing 10 mammae instead of 12. There is a subvariety of the house-rat which is smaller and of more uniform colour, and has two pairs of inguinal mammae instead of three; it appears to be identical with *Mus concolor* described by Lloyd in Rangoon; in some parts as many as 45 per cent. of house rats are *M. concolor*. Of 615 rats captured in the boats and ships lying in the harbour of Soerabaia nearly all were *M. rattus* of the large subvariety; it has been found in goods wagons. The house rat migrates from house to house and from village to village. Breeding takes place throughout the year, but more gravid rats are found in April, May and December than in the rest of the year. From 1 to 12 per cent. of the rats caught in houses are field rats; they seek human dwellings when supplies in the country become exhausted.

Mus decumanus has a much more limited habitat than *M. rattus*, and occurs only at the seaports and along the rivers.

Nesokia setifera, *Crocidura coerulea*, and *Chiropodomys gliroides* and *C. anna*, though present, appear to play no part in the diffusion of plague in Java.

Fleas.—Xenopsylla cheopis and *Pygiopsylla ahalae* are the only rat-fleas found in the plague area. Some 20,000 flea counts have been done: in plague-free localities the average number of fleas per rat has ranged between 0·2 and 0·8. Many charts are given in which it is seen that as the average flea count increases so do the number of cases of human plague. A map of Malang also is included in which are shown the villages with rat flea counts above and below 1·7, and plague distribution; the plague areas correspond with the high flea ratio.

The eggs of *X. cheopis* hatch in 4-8 days, and the larvae develop into mature fleas in 31-52 days. Humidity is favourable to their development, for when the air was driest fewer eggs hatched, and the larval and pupal stages were prolonged; too much moisture, however, kills the larvae in 9 days.

Of 38 fleas reared in the laboratory 36 survived 7 days, though they had never been fed, 13 lived 14 days, and one 20 days. Of 75 fleas which had sucked blood, 19 were alive at the end of 10 days; but they were all dead at the end of 16 days except 4, one of which lived 21 days.

Though the rat-flea can leap a distance of 18 cm., it rarely travels far; one metre a day is about the rate of progress.

The Java rat-flea attacks man sometimes after 24 hours' starvation, but generally not until three days after being deprived of food.

Ants immediately prey upon fleas and their larvae, when they are confined together. Some fleas bred in captivity become infested with an acarus which fixes itself to the abdomen and thorax of the flea. This insect is probably the "hypopusstadium" of the Tyrogliphinae (cheese mite). Fleas harbouring these acari fed on the blood of a plague animal did not convey plague.

Iodoform does not kill fleas, nor prevent their bites; fleas starved for two days avoided for two hours skin the surface of which had been covered with cajeput oil, but this effect passed

off in five hours. Exposure of fleas for one hour to the vapour of carbon disulphide was necessary to ensure their destruction. Carbon monoxide required the same time. 60 out of 100 fleas remained alive after 4 hours' exposure to carbon tetrachloride vapour. Sulphur dioxide fumigation destroys fleas in half an hour. Steam at 60° C. kills them in that period.

Transmission.—A large series of experiments was carried out to ascertain how long rat-fleas remain infective after feeding on a plague rat; 28 days was the limit. Fleas kept without food were infective till the sixth day. Three infective fleas were sufficient to excite the disease in rats.

Seven series of tests were made, in which 20-40 infected *X. cheopis* were placed on healthy rats and guinea-pigs, 14 to 42 animals being used in each experiment; 93-100 per cent. of the guinea-pigs died of plague, and 55-74 per cent. of the rats.

The *B. pestis* was found in the midgut of *X. cheopis* until the 18th day after its infecting meal, and in the rectum till the 15th day. But fleas may transmit plague by their proboscis as well as by their dejecta; for 25 infected fleas were induced to bite the shaven skin of three guinea-pigs through a layer of gauze; all the animals died of plague although no faecal matter came in contact with them.

The flea, *Pygiopsylla ahalae*, is found in much smaller numbers than the *X. cheopis*, and disappears entirely in the rains in some places. It can convey plague from rat to rat, but it does not bite guinea-pigs. Four out of 5 rats died of plague, after being bitten through gauze by *P. ahalae*.

Nine experiments were made in which from 7-254 body-lice removed from the clothing of plague patients were inoculated cutaneously into guinea-pigs; they all died of plague in 4-11 days, with the exception of the animal which received the 7 pediculi. *Cimex rotundatus* did not transmit the disease.

In several of these various transmission tests, more especially those with *P. ahalae*, the animal did not die for 3 or 4 weeks, when the appearances of chronic plague were found post mortem. A similar condition was induced in rats by inoculating them with a very small dose of infective material.

The *Trypanosoma lewisi* is conveyed by fleas; hence it would seem probable that the greater the number of fleas per rat the greater percentage of rats would be trypanosome carriers: curves are given showing that this is the case. But if there has been an epizootic of plague among the rats of a locality, we might expect a concentration of the fleas on the surviving rats, hence the flea curve would rise, while the trypanosome curve would remain stationary. Charts of plague areas where this has been observed are supplied.

The effect of human intercourse on the spread of plague was measured by counting the parasites in the clothing and baggage of 64,431 people who had been in contact with plague: 9,557 pediculi, 779 *Cimex rotundatus*, 237 *Pulex irritans*, 9 *Xenopsylla cheopis*, 9 *Ctenocephalus canis*, and 1 *P. ahalae* were captured.

Summary.—In Malang the rat-flea is the transmitter of plague; it remains infectious longer than in India, 28 days against 15 days. In East Java rat immunity is low. At Soerabaia it is greater.

The variations in the seasons are too small to exert an appreciable influence on the average number of fleas per rat, hence plague is not limited to one period of the year; sometimes it prevails in the rainy season and sometimes in the dry.

The spread of plague probably occurs through the carriage of house-rats in ships, boats, railway vans, and in merchandise generally, and also by their own migrations from house to house, and village to village. The *M. decumanus* and field-rat play little part in the diffusion of plague in Java.

It is possible that human lice may disseminate the disease.

Rat-plague may exist in a locality for months without man becoming infected; should therefore, human plague arise at any time, it does not follow that it has been imported from without.

There appears to be a connection between a high flea-count and rat-plague. A rising flea curve with a stationary trypanosome curve is suggestive of a rat epizootic.

For the prevention of plague, inspection of goods and control of their transport are essential; the control of human intercommunication is not so important.

C. B.

Brown (B. W.). **Plague. A Note on the History of the Disease in Hongkong.**—*U.S. Public Health Rep.* 1913. Mar. 21. Vol. 28. No. 12. pp. 551-557.

Somewhat nebulous references to plague in China appear from the year 1844 onwards. The first epidemic in Hongkong began in May, 1894; it was introduced from Canton where plague was inflicting great ravages on the population. Some thousands of deaths occurred in Hongkong. In 1895 there were only 45 cases of plague among the population of about a quarter of a million persons. In 1896 there were 1,204 cases; in 1897, 21; in 1898, 1,320; in 1899, 1,486; in 1900, 1,086. In 1901 the campaign against rats was begun; 77,301 were caught. In 1902 there were 572 cases of plague; the whole of the sanitary staff, including 200 coolies, was inoculated with Haffkine's vaccine; no plague attacked them, though in the previous year 7 rat-catchers out of 30 died of the infection. In 1903 there were more than 1,300 cases; in 1904 there were 510. From 1905 to 1911 with the exception of 1908, the epidemics were small. During this period many houses had been rendered rat-proof, and rat destruction had been carried on, yet a severe outbreak began in January, 1912. From January to September there were 1,848 cases.

In all the epidemics the outbreak has usually begun in April, has reached its maximum in June, and has declined rapidly in July and August. This represents the rainy season, the maximum rainfall being in June. The large majority of cases has been of the bubonic type, the septicaemic form comes next, and pneumonic plague last in the order of frequency. The European has generally escaped.

Hongkong is infested with mice, *M. rattus* and *M. decumanus*.

The author concludes that bubonic plague is endemic, and rat infection is always present. Every vessel that is dry-docked, or goes to a wharf without proper precautions is liable to be infested with plague rats, and he states that the most important quarantine measure applicable to Hongkong is frequent sulphur fumigation of vessels.

C. B.

Prophylaxis.

Foy (F. A.). **Port Health Inspection as a Factor in Plague Prevention.**—*Jl. of State Medicine.* 1913. May. Vol. 21. No. 5. pp. 282-289.

In the years 1901-1908, 2,224,260 immigrants to Burmah landed at Rangoon; 23 cases of plague were detected among them, or 1 in 96,707. Since the abolition of the inspection of immigrants in 1908, 7 cases of plague are known to have occurred among 1,094,324 arrivals in the following three years, or 1 in 156,000. These included many immigrants from plague-free ports, but among 383,839 from infected ports 19 cases of plague were discovered in 5 years, or 1 in 20,202.

One in 56,000 of 1,299,187 people leaving Rangoon were plague-infected and 1 in 44,063 of 132,187 emigrants from Rangoon to ports out of India developed plague during the last three years.

The author therefore questions whether it is worth while to inspect passengers who are proceeding from an infected port, particularly when the duration of the voyage covers the incubation period of 5-7 days. The inspection of immigrants is necessary, if they arrive from plague areas.

C. B.

Simpson (Friench). **Rat Proofing. Its Practical Application in the Construction or Repair of Dwellings or other Buildings.**—*U.S. Public Health Rep.* 1913. Apr. 11. Vol. 28. No. 15. pp. 679-687. With 20 figs.

Walls should be at least 6 inches thick when made of brick or concrete, and should extend not less than 18 inches below the surface of the soil. Floors should be composed of concrete 3 inches thick, with a layer of half an inch of cement on the surface. Ventilation openings must be screened with cast-iron grating, or wire gauze not less than 20 gauge, and not greater than ½ inch mesh. All openings round wires and pipes must be sealed with cement.

C. B.

Treatment.

Connor (F. Powell). **The Results obtained in a few Cases of Bubonic Plague by the Intravenous Injections of Dilute Solution of Iodine.**—*Jl. London School Trop. Med.* 1913. Apr. Vol. 2. Part 2. pp. 148-149.

Six intravenous injections of one drachm of a solution of iodine, which consisted of seven parts of tinct. iodi and sixty parts of distilled water, were given in the course of two days to a patient in whose blood plague bacilli were seen microscopically; although he was suffering from plague in its severest form, he recovered. Two boys also were treated in a similar way, but with somewhat smaller doses; they both made perfect recoveries.

C. B.

Rat-Fleas in England.

i. Nuttall (George H. F.). **Observations on British Rat-fleas July-October, 1911.**—*Parasitology.* 1913. Apr. Vol. 6. No. 1. p. 1.

ii. Strickland (C.) & Merriman (G.). **Report on Rat-fleas in Suffolk and North Essex.**—*Ibid.* pp. 2-18. With 3 charts.

iii. Nuttall (George H. F.) & Strickland (C.). **Report on Rat-fleas in Cambridgeshire.**—*Ibid.* pp. 18-19.

i. The investigations described in ii and iii were undertaken in Suffolk, North Essex, and Cambridgeshire. The fleas were collected in the field immediately after the rat had been caught and killed.

ii. In 1910 Martin and Rowland found that rat plague prevailed chiefly in those parts of Suffolk where fleas were most numerous on rats, and they isolated plague-like organisms from the intestine of fleas infesting plague rats.

Rats were put into calico bags immediately after being killed, and the bags were placed in tins, into which chloroform was dropped. The fleas abandoned their host and died in a few minutes; they were preserved in 50 per cent. alcohol. To render fleas transparent for microscopical examination, they are transferred from alcohol to a strong phenol solution, in which they are left a day; then after being treated with clove oil for a few minutes, they are mounted in balsam.

M. decumanus was the only rat caught, and it was scarce in the summer. 75 per cent. of 822 rats harboured fleas; on one there were 105, and on several 30 or 40 fleas. Two charts are given in which it is seen that the rat-fleas decrease as the temperature and humidity of the air decline. It has been proved that *C. fasciatus* can convey plague from rat to rat, and that it bites man, but the authors could find no correlation between the average number of *C. fasciatus* per rat and rat plague. It deserts dead rats later than other species; it is also a parasite on mice and rabbits. *C. agyrtes*, although it does not attack man, is found on mice, and may spread plague epizootics. The rabbit-flea, *Spilopsyllus cuniculi*, said to bite man, and *C. musculi*, the mouse flea, are caught sometimes on rats. Lice were observed on 5 rats only.

Summary.—

(1) We found an average of four fleas per rat: 822 rats were examined and 3,293 fleas taken.

(2) The average was subject to a local variation (0·6 to 6·5).

(3) 15 species of fleas were taken from the rats, but of these there were only two species, *C. fasciatus* and *C. agyrtes*, which occurred in any numbers.

There were—

C. fasciatus	1,986,	or about	60	per cent.
C. agyrtes	1,257	,,	38	,,
Rare species	50	,,	2	,,

(4) The average number of fleas per rat and the percentage of rats infested by fleas showed a well-marked seasonal variation, there being a considerable decline in the numbers as the cooler weather came on. *Ceratophyllus fasciatus* and *Ctenophthalmus agyrtes* both participated in a similar way in this variation.

(5) *C. fasciatus* is chiefly found on rats caught near human habitations; *C. agyrtes* on those caught in the hedge-rows.

iii. 297 fleas were obtained from 150 rats caught in Cambridge and its neighbourhood; they were mostly *C. agyrtes*, which were found in largest numbers during February and March. A single specimen of *P. irritans* was secured.

C. B.

UNCLASSED.

BARBER (M. A.). **The Susceptibility of Cockroaches to Plague Bacilli inoculated into the Body Cavity.**—*Philippine Jl. Science.* Sect. B.—*Philippine Jl. Trop. Med.* 1912. Dec. Vol. 7. No. 6. pp. 521-524.

Inoculations of about two and a half millions of virulent *B. pestis* were made into the legs of 61 cockroaches, *Periplaneta americana* and *Rhyparobia maderae*; six died of unmixed plague infection within two days.

The author finds that cockroaches may be infected by large doses of virulent plague bacilli, but from the fact that massive doses failed to infect a large proportion of cases it may be concluded that these insects, especially *Rhyparobia maderae*, are little susceptible to plague inoculated into the body cavity.

C. B.

HOSSACK (D. C.). **Some Lessons of the Manchurian Plague Epidemic.**—*Jl. of State Medicine.* 1913. Apr. Vol. 21. No. 4. pp. 228-233.

The value of this article can be assessed by quoting the author's own words: "I maintain that the time has come when, even in England, it must be acknowledged that the rat-flea theory is an erroneous one that has failed to stand the test of practical experience."

There is no record of any experimental work by him in the transmission of plague.

C. B.

DE RAADT (O. L. E.). **De critiek van Dr. Kiewiet de Jonge op mijn oordeel over het Pestvaccin.**—*Geneesk. Tijdschr. v. Nederlandsch-Indie.* 1913. Vol. 53. No. 1. pp. 155-164.

DE JONGE (G. W. Kiewiet). **Antwoord aan Dr. de Raadt.**—*Ibid.* 1913. Vol. 53. No. 1. pp. 165-172.

After making somewhat arbitrary assumptions, de Raadt modifies the statistics of inoculation against plague which he gave originally (see this *Bulletin*, Vol. 1, p. 317). By so doing he has reduced the incidence of plague among the uninoculated from 0·86 per cent. to 0·68 per cent., and has increased the incidence in those who were inoculated with the Dutch vaccine from 0·26 to 0·5 per cent.; and in those inoculated with Haffkine's prophylactic from 0·16 to 0·31 per cent. He states that it has not

been proved that the Dutch vaccine confers the least immunity against plague.

After criticising his statistical methods, de Jonge traverses de Raadt's last statement. Of 1,688 not-inoculated who were seized with plague, 1,363 died; and of 133 who had been inoculated with the Dutch vaccine, subsequently attacked with plague, 105 died; that is, the mortality was 1·8 per cent. less in the inoculated than in the uninoculated. On working out the probability, he finds that the chances are over 2 to 1 that the slightly diminished mortality of the vaccinated plague cases is causal and not accidental.

[No detailed statistics are given, hence these polemical papers are not of much worth.]

C. B.

Saisawa (K.). i. **Ueber die Pseudotuberkulose beim Menschen.** [Pseudo-tuberculosis in Man.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1913. Vol. 73. No. 3. pp. 353-400. With 4 plates.

ii. **Vergleichende Untersuchungen über den Bacillus der Pseudotuberkulose.** [Comparative Experiments with the *B. pseudo-tuberculosis.*]—*Ibid.* pp. 401-420.

i. Rowland pointed out the close relation which exists between the *B. pseudo-tuberculosis rodentium* of Pfeiffer and *B. pestis* (see this *Bulletin*, Vol. 1, p. 544). The author observed a case of fever in Japan in the year 1909, in which the symptoms were those of enteric fever complicated with tonsillitis and jaundice, which ended fatally on the eleventh day. The Peyer's patches were greatly swollen, and ulceration was beginning. Grey points, the size of a head of a needle, were visible in the interior of the liver and spleen. The *B. pseudo-tuberculosis* was isolated from the blood withdrawn on the tenth day of the fever, and from fluid aspirated from the pericardium on the day after death, but many contaminating bacteria were obtained from the other post-mortem material. The author nevertheless concludes that the organism which he isolated from the blood during life was the cause of death, and that it is identical with the *B. pseudo-tuberculosis* of Pfeiffer.

ii. The original *B. pseudo-tuberculosis rodentium* of Pfeiffer; a culture isolated from guinea-pigs by Abel; a culture obtained by Lorey from the blood of a man who was suffering from an enteric-like fever and jaundice; a culture isolated by Albrecht from the ulcerated portion of the ileum of a man which had been resected during life; and the author's bacillus; were submitted to comparative bacteriological and biological tests. No marked differences were discovered between them. They were all strongly pathogenic to rabbits, guinea-pigs, and mice; but rats resisted subcutaneous inoculation. Vaccination with one strain protected the animal from an otherwise fatal dose of another.

C. B.

Galli-Valerio (B.). *Bacterium pseudopestis murium* **n. sp.**— *Centralbl. f. Bakt.* 1. Abt., Orig. 1913. Mar. 1. Vol. 68. No. 2. pp. 188-194. With 5 figures.

A rat died three weeks after drinking spring water from the Jura, suspected of causing goitre; its spleen was enlarged and there was an abscess in its thyroid gland. From the pus a bacillus which closely resembled the *B. pestis* was isolated: the growths however were not so abundant as those of *B. pestis* and they soon died. Half a cc. of a broth culture inoculated subcutaneously caused the death of a *Mus rattus* in 70 days, in which the post mortem appearances were emaciation, loss of hair, enlarged spleen, and abscesses in the thyroid gland and lung from which the micro-organism was recovered and gave rise to similar lesions in other rats three or four months after inoculation; sometimes also the testes were enlarged.

Although cultures were not obtained directly from the spring water, the subcutaneous injection of half a cc. of the centrifuged deposit caused a fatal infection to a *M. rattus* after three months.

A guinea-pig was refractory to one cc. of a broth culture. A rabbit died two months after an injection of one and a half cc.; it became emaciated and lost most of its hair.

The bacillus probably belongs to the group *B. pseudo-tuberculosis rodentium.*

Summary.—

The name *B. pseudopestis murium* is proposed for an organism isolated from the lymphatic glands, thyroid, testes, and spleen of a *Mus rattus.*

The infection probably was conveyed in spring water from the Jura.

The thyroid gland is often invaded by the bacterium.

C. B.

Erratum.

Bulletin Vol. 1, p. 316, line 8, for "feet [sic]" write "gut." Capt. Knowles writes that this was the word used in his MS.

BERIBERI.

VEDDER (Edward B.) & CLARK (Elbert). **A Study of Polyneuritis Gallinarum. A Fifth Contribution to the Etiology of Beriberi.**— *Philippine Jl. of Science.* Sec. B. [*Philippine Jl. of Trop. Med.*] 1912. Oct. Vol. 7. No. 5. pp. 423-458. With 11 plates.

The authors describe the symptoms and pathology of polyneuritis gallinarum, illustrating the latter by 11 photo-micrographs which are excellently reproduced. In a summary of the work it is noted that three types of the disease are found: (1) A form in which the symptoms of neuritis and general prostration are combined; this is the usual form. When the birds are given an extract of rice polishings they improve at once in general condition, but the symptoms of neuritis only disappear after several months. (2) A form in which there is pronounced neuritis but the bird remains in good health. These recover after several months of treatment. (3) Fulminating cases, in which the symptoms of neuritis are absent, but in which greater general prostration occurs; these birds speedily recover when given extract of rice polishings.

After prolonged feeding on polished rice very marked degenerative changes are found in the vagus, sciatic, and peripheral nerves, affecting both the myelin sheath and axis cylinders. Degenerative changes are also observed in both dorsal and ventral roots, in the fibres of all the columns of the thoracic spinal cord, and in the large cells of both ventral and dorsal horns of the lumbo-sacral cord. When fowls, fed on polished rice, received a small amount of protective substance, all the evidence of nerve degeneration came on after a prolonged incubative period, from 43 days to one year of such feeding. Ten grams of white wheat, or 5 c.c. of canned milk added to the diet of polished rice gave little or no protection; a small quantity of meat, potatoes, or fresh cows' milk gave partial protection; but 10 grams of dried peas or peanuts gave complete protection for at least 60 days.

The following conclusions are given:—

1. In addition to the changes demonstrated above, FUNK has shown that chemical changes take place in the brains of fowls suffering from polyneuritis gallinarum. It therefore appears that the disease is not simply a peripheral neuritis as has been generally supposed. On the contrary, the entire nervous system is affected.

2. The symptoms of the disease are not chiefly referable to degeneration of the peripheral nerves, since the degeneration occurs before symptoms arise, and because advanced degeneration may be present accompanied by no symptoms at all, and because degeneration of the nerves remains after recovery has occurred.

The authors do not regard polyneuritis gallinarum as identical with beriberi in man, but experiments show that the cause is the same, viz. the want of the neuritis preventing substance in the food; "the two conditions are due to pathological processes causing slightly different manifestations in diverse species" (VEDDER and

Chamberlain). The authors deduce from the feeding experiments on fowls important facts concerning the relation between diet and beriberi in man. As meat and potatoes contain a small quantity of the neuritis preventing substance, those who subsist almost entirely on them are free from beriberi; while if these are only added in small quantities to a diet deficient in protective substance, the symptoms are manifested. Wheat bread and biscuit made from over-milled wheat flour are deficient; ship beriberi develops in those living mostly on the latter, and beriberi among the native population of Labrador who live during certain seasons almost exclusively on the former. It is also important to note that peas and peanuts possess the property of preventing the disease, and can be used prophylactically on board ship; the fact that cooked meat and potatoes afford more protection than when taken raw is at present unexplained.

The organic base, called vitamine by Funk, is accepted as the essential substance required for normal metabolism of nervous tissue; if this is reduced even slightly below the requirements of the particular subject, degeneration of nerves occurs and if continued, neuritis follows. In cases where there is a great loss of weight without neuritis it is possible that this is due to a deficiency of fat, phosphorus, or potassium. The very great prostration sometimes found may be due to degeneration affecting the higher nerve centres in the brain or cord. It is suggested that there may be two vitamines which are essential for proper metabolism of the body, one the neuritis preventing substance, the other a substance which prevents general prostration, cardiac failure, &c.: this hypothesis would account for the three classes of symptoms found in fowls, and would explain the cases of ship beriberi without neuritis, and possibly the disease known as "epidemic dropsy."

[This paper should be read in the original by all interested in the subject.]

P. W. Bassett-Smith.

Yamagiwa (R.), Koyano (T.), Midorikawa (H.), & Mogi (T.). **Experimental Study of the Cause and Nature of the Beriberi. Report 1.** (The original in No. 23, Vol. 26, 1912, of the *Jl. Tokyo Med. Assoc.*)—*Sei-I-Kwai Med. Jl.* 1913. Feb. 10. Vol. 32. No. 2. pp. 12-15.

The object of these experiments was to show whether it was possible to produce in fowls, by subcutaneous injections of artificially fermented solutions of polished rice, the polyneuritic symptoms commonly seen when these birds are fed on polished rice. The solution for injection was obtained by placing 2 litres of the rice with 800 c.c. of water in a shallow dish for 48 hours at 40°C. The following results are recorded. A proportion of the fowls so treated showed symptoms of the disease; in addition to the polyneuritis a certain amount of cyanosis of the comb and diarrhoea were produced. The unsterilised solution after fermentation for 48 hours was more powerful than after 24 hours; it was still efficacious after passage through a Chamberland filter and sterilisa-

tion. It was found that simple infusions of rice given subcutaneously did not produce the same symptoms, but a dilute solution of acetic acid of equal acidity to that of the fermenting rice solution when injected quickly caused the fowls to die without producing any trace of paralysis. The post mortem changes found in three fowls examined were dilatation of the heart, congestion of the internal organs, and degeneration of the nerves, muscles, and arteries, conditions similar to those found in fowls fed on polished rice; there was also a catarrhal state of the intestinal mucous membranes. From their experiments the authors consider that the symptoms and pathological changes in birds fed on polished rice and injected with fermenting rice solutions coincide, also that some birds are more refractory than others to both measures, the difference depending upon the affinity of the tissues for the poison. The following conclusions are given:—

(1) The disease produced by the injection of a fermented solution of polished rice is an intoxication.

(2) This intoxication disease and the beriberi-like disease of fowls caused by feeding are the same.

(3) As the former is absolutely proved to be an intoxication, so must the latter be.

(4) The beriberi-like disease of fowls caused by feeding with polished rice is not a so-called "partial inanition."

P. W. B.-S.

Funk (Casimir). **An Attempt to estimate the Vitamine-Fraction in Milk.**—*Biochemical Jl.* 1913. March. Vol. 7. No. 2. pp. 211-213.

The author, in continuation of his experimental work on the food problem and its relation to polyneuritis in birds and beriberi in man, has in this paper drawn attention to three lines of research. (1) What is the normal amount of vitamines in milk of different species, including the human? (2) Is there a definite relationship between the amount of vitamines secreted in the milk and that ingested in the food? (3) What effects have boiling and pasteurisation on the vitamine content of milk?

The experiments here described show that ordinary chemical methods for estimating vitamines are not sufficient; colorimetric methods are therefore required. From 1 litre of milk 1-3 cgm. of vitamine were obtained, giving 1-2·5 mgm. of nitrogen; the residual nitrogen, amounting to 20-50 mgm., represents probably allantoin; therefore 1 litre of milk contains 0·06-0·15 grm. allantoin, which agrees with the amount found by Ackroyd (0·199 grm.). Artificial protein-free milk, as was used by Osborne and Mendel (1912) in their experiments on growth, differs from true protein-free milk in being deficient in these nitrogenous substances, which may play an important part in process of growth. The experiments show that milk which has been deprived of its fats by centrifuging loses about 50 per cent. of vitamine and allantoin; also that allantoin, like vitamine, is destroyed by boiling.

P. W. B.-S.

Funk (Casimir). **Studies on Beri-Beri. Further Facts concerning the Chemistry of the Vitamine-Fraction from Yeast.**—*Brit. Med. Jl.* 1913. April 19. p. 814. With 1 plate.

The author, in 1911, described the preparation of a vitamine fraction from rice polishings, which was effective both as a curative and a protective agent in birds suffering from polyneuritis caused by feeding on polished rice; a single substance was then isolated. In 1912 a similar vitamine fraction was obtained from milk, yeast, brain, and lime juice, but this was less active than the crude product. Since that time other purin and pyrimidin derivatives have been shown to be present, possessing slight curative effects. From 100 kg. of dried yeast the total amount obtained was 2·5 grams. A series of experiments is described, showing that birds badly paralysed, which would have died in less than 24 hours, were cured by injections of 4 to 8 mgm. of the vitamine fraction. If kept on the same diet they again developed the severe symptoms, showing that the injected substance was soon used up for metabolic processes; a fresh injection again effected a cure. By further experiment the author has been able to separate three distinct substances, which have been purified and analysed. The observations of Führer on the composition of pituitary extract are somewhat similar, for he found four substances to be present, each having a specific action, but the effect of the original extract could only be obtained by the collective action of all four; it remains to be proved whether the same is the case in the vitamine fraction or whether one substance plays a preponderating part in the process of cure. For therapeutic purposes the best results at present may be expected from the use of the whole vitamine fraction, especially in acute cases.

P. W. B.-S.

Tsuzuki (J.). **Eine Beriberiepidemie auf Fischerbooten bei den Tsishima-Inseln (Japan).** [An Epidemic of Beriberi in the Fishing Fleet at the Tsishima Islands.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1913. May. Vol. 17. No. 9. pp. 306-308.

A description is given of an epidemic of beriberi which occurred in the fishing fleet working between Jeso and Kamschatka. The disease broke out in August, and lasted throughout September and October. The men employed were all Japanese, mostly from the district of Awa, and when affected were removed to their homes for treatment. The author, Director of the Beriberi Institute at Tokio, was sent to investigate the cause of the epidemic, and to institute measures for the prevention of further outbreaks. There were altogether 249 men employed; 92 suffered from the disease, and 19 died. It was found that all the severe cases occurred in the vessels of the Enyo company, which supplied rice as the staple diet for their crews, whereas the other boats had a rice-barley diet: to the preponderance of rice diet on the ships of the Enyo company the epidemic was mainly due.

A table is given of the incidence and death rate in the different companies employed, which is highly interesting.

Name of Company.	Number of vessels.	Number of crews.	Number of cases.	Number of deaths.
Enyo	10	186	73	19
Niigata	2	47	16	0
Hōkō	1	16	3	0
Total ...	13	249	92	19

P. W. B.-S.

Gregg (Donald). **Infantile Beriberi in the Philippines.**—*Boston Med. & Surg. Jl.* 1913. May 8. Vol. 168. No. 19. pp. 676-678.

The author gives an historical and clinical history of the disease, gathered mostly from the works of previous writers, more particularly those of Chamberlain, Vedder, and Andrews; these have already been reported on in this *Bulletin*. From his own experience he emphasises the suddenness with which an apparently healthy baby may die from an acute cardiac attack. The prophylactic measures recommended are: (1) Sufficiently nourishing diet to the nursing mother. (2) Substitution of artificial feeding for breast milk. (3) The administration to the infant of extracts of rice polishings, locally called "tiqui-tiqui"; the preparation is sweet and pleasant to take, and efficacious and rapid in its action; 5 cc. are given daily. The last method is often the only one practicable.

P. W. B.-S.

Genuardi (G.). **Alcuni Casi di Beri-beri osservati sulla Regia Nave "Calabria," con Considerazioni Cliniche ed Eziologiche.** [Some Cases of Beriberi in the Royal Naval Ship "Calabria."]—*Ann. di Med. Navale e Colon.* 1913. Jan. Anno 19. Vol. 1. No. 1. pp. 12-22.

Seven cases of beriberi are described from a clinical standpoint, and some of the etiological factors are noted. All the cases occurred on board the R.N. ship "Calabria," which had been for two years in the far east, had visited China and Japan, and proceeded to Massawa (Red Sea) in February 1912. Details are given; the cases were mostly of the oedematous type and none were fatal. The most interesting points noted are the following: the disease did not appear until 4 months after leaving China, or 5 months after leaving Japan, and other cases occurred in the "Puglia" and "Volturne," also in the Red Sea, these ships not having been to the far east but being in communication with the "Calabria." With regard to the food, it is stated that the nutrition value of the rations served out was unknown; rice was provided four times a week, but it did not constitute the principal food. The predisposing causes were:—(1) Great heat

and humidity, which may favour the growth of a germ. (2) Excessive fatigue in a tropical climate. The conditions under which the men lived at Assab and in the Red Sea were said to have been very trying. On the appearance of the first case the issue of rice was stopped, and the epidemic quickly ceased.

P. W. B.-S.

Montefusco (A.). **Su Due Casi di Beri-beri. Osservazioni Cliniche.** [Clinical Observations on Two Cases of Beriberi.]—*Ann. di Med. Navale e Colon.* 1913. Jan. Anno 19. Vol. 1. No. 1. pp. 23-30.

The author gives a short summary of the geographical distribution of beriberi and its occurrence in the Italian Navy. He describes two cases, admitted from the "Piemonte" and treated in the hospital at Massawa. The results of the blood examinations are given; in one there was a marked eosinophilia, in both an increase in the mononuclear leucocytes. He states that the cases furnished no new clinical or etiological facts, but as rice is very little used in the Naval ships at Massawa, it was probably not the causative agent.

P. W. B.-S.

Richer. **Rapport sur une Epidémie de Béribéri a la Prison de Loango (1911-1912).**—*Ann. d'Hyg. et Méd. Coloniales.* 1913. Jan.-Feb.-Mar. Vol. 16. No. 1. pp. 145-156.

The occurrence of several small epidemics of beriberi in the prison at Loango, Congo Française, forms the subject of this paper. During March, 1911, four cases were recognised; these were of the wet form, and all recovered. Steps were at once taken to stamp out the disease: the existing diet, of white rice and dried fish, was improved by the addition of fresh meat, the prison was disinfected, and the prisoners were made to exercise in the open air. No fresh cases occurred until the end of August, when a number of Bayakas were received; these prisoners were in a miserable condition, and 7 days after their admission eight developed marked gastric symptoms, eight definite cases of beriberi were treated in the hospital, and three died. After considerable difficulty fresh provisions were supplied, and the disease did not increase. The supplies of fresh food (manioc) then failed, and beriberi again broke out in January (11 cases, with 2 deaths). Fresh manioc, fruit &c. was once more procured, and the epidemic ceased. Clinically the forms were associated with marked cardiac symptoms and much oedema; phlebitis of one of the deep veins of the thigh occurred in one chronic case, this being followed by suppuration, and death of the patient. A post-mortem was made in one case only, but nothing definite was determined. The author states that the difficulty of providing fresh provisions in the prison was very great, but that there could be little doubt that the outbreaks of the disease were due to the deficiency of fresh food, and were favoured by the debilitated condition of many of the prisoners.

P. W. B.-S.

Cozanet. **Relation d'une Epidémie de Béribéri ayant sévi à Gao (Haut-Sénégal-Niger).** — *Ann. d'Hyg. et Méd. Coloniales.* 1913. Jan.-Feb.-Mar. Vol. 16. No. 1. pp. 157-169.

The author, who was sent to investigate an epidemic of beriberi which had broken out at Gao, gives a detailed account of the cases which occurred, and the measures employed to stamp it out. Thirty cases were noted in the tirailleurs, with four deaths: clinically they were all of the moist form, and were not very severe. The measures used were, substitution of millet for rice, thorough disinfection of the quarters, isolation of all cases, and inspection to detect early forms. The author's view was that the epidemic was not due to alimentary intoxication, but to an infective agent not yet known.

P. W. B.-S.

Doyle (Stanley B.). **Beriberi. A South American Aspect of the Disease.**—*New York Med. Jl.* 1913. Apr. 19. Vol. 97. No. 16. pp. 828-829.

This disease, the author says, is extremely prevalent along the west [east] coast of South America, from the Amazon river in the north to Rio del Plata in the south. A short account of the disease, as usually met with, is given and two cases are described in detail.

P. W. B.-S.

Schüffner (W.). **Ist die Beriberi eine auch in Europa heimische Krankheit?** [Is Beriberi endemic in Europe?]—*München. Med. Wochenschr.* 1913. Mar. Vol. 60. No. 12. pp. 642-647.

The author, from his experience in the Dutch East Indies (Deli), shows that beriberi has ceased to be epidemic there, and now causes practically no mortality. He describes the symptoms of the disease and goes fairly fully into the food deficiency theory, which he practically accepts, but he asks—Do the protective substances act as (1) food stuffs, (2) as building stones in the molecular synthesis, or (3) have they a specific effect on internal secretions, playing the part of hormones? He believes that beriberi is not epidemic in Europe owing to the fact that the food used is never absolutely deficient in the protective substances; such articles as bread and potatoes are fairly rich in proteids and salts, and therefore probably contain the essential bodies; the disease however may occur sporadically from errors of diet and destruction of the protective substances by bacterial action. It is probable that the polyneuritis following typhoid fever is due to the restricted diet, the pseudotabes of diabetes to the cutting off of the hydrocarbons, the neuritic condition of sucklings to the imperfect nourishment of the pregnant woman—these conditions being forms of secondary beriberi. A good many of the alimentary and developmental affections incident to early childhood may very well be initial stages of beriberi. The author thinks that all cases of progressive polyneuritis found in Europe should be carefully examined with

regard to their etiology and treatment. Maurer, Oppenheim, and Dürck have each suggested the possibility of beriberi occurring in Europe.

[This paper is mostly theoretical and contains no new facts.]

P. W. B.-S.

Strong (Richard P.) & Crowell (P. C.). **The Etiology of Beriberi.**—*Bull. Soc. Path. Exot.* 1913. Mar. Vol. 6. No. 3. pp. 195-198.

This is a resumé of the experiments carried out on a number of prisoners under sentence of death, to prove whether beriberi in man is an infectious disease, or, like the polyneuritis gallinarum (Eijkman), is due to a deficiency in the food. The conclusions arrived at were definitely in favour of the latter, and confirmed the early work of Fraser and Stanton. The original paper in the Philippine Journal of Science (Vol. 7, No. 4, 1912) has been already reported upon in this *Bulletin* (Vol. 1, p. 477).

P. W. B.-S.

Le Dantec (A.). i. **Note sur un Mycoderme rencontré dans les Fèces de deux Matelots Béribériques.**—*Compt. Rend. Soc. Biol.* 1913. Feb. 28. Vol. 74. No. 8. pp. 412-413.

ii. **Mycodermose Intestinale dans divers États Pathologiques.**—*Ibid.* pp. 414-415.

(i) In December 1911, during the examination of the faeces of two Europeans suffering from ship beriberi, the author recognised the presence of a mould, which has not been found before in the intestinal flora of man. The two cases came from the "Antoinette," on board which ship there was said to be an epidemic of beriberi; the men were treated in the hospital at Nantes. A full description of the cultural characters is given, and it is stated that the stab culture in gelatine is very similar to that of *B. anthracis*, showing lateral outgrowths, and causing very slow liquefaction of the medium. Growths on glucose agar had a grey colour, were thick and moist, and had a wavy outline. Aerial hyphae were not found. Milk became slowly acid, and gave off a foetid odour. The organism injected under the skin is not pathogenic to rats, guinea-pigs, and fowls; intra-peritoneal injections into guinea-pigs produced a peritonitis which was not fatal.

The author, in conclusion, states that the presence of mycoderms in the intestine of beriberi cases has no specific value; it indicates only that the intestinal secretions are unable to prevent their growth if they are introduced in food.

(ii) The above-mentioned discovery led the author to examine for the presence of the same micro-organism in other pathological states. Similar organisms having no specific differences were found abundantly in the faeces of six mental cases, namely, three melancholics, one epileptic, and two others.

P. W. B.-S.

Ogata (C.). **On the Blood Vessels by Beriberi.** (To be followed.) [The original in Nos. 13, 14, Vol. 26, of *Jl. Tokyo Med. Assoc.—Sei-I-Kwai Med. Jl.* 1912. Nov. 10. Vol. 31. No. 11. pp. 245-247.

From a study of the blood vessels of beriberi and non-beriberi cases the author came to the following conclusions.

1. Rigor mortis of the vessels appears 2 to 3 hours after death and reaches its maximum in 7 to 15 hours; it then gradually disappears and after 24 hours the vessels are absolutely relaxed. In beriberi the contraction is more marked than in non-beriberi cases. 2. There is some irregularity in the tunica media of the vessels in beriberi, with spaces between the cells. 3. In one case of beriberi a transmigration of the cells of the involuntary muscle fibres was recognised in the dorsal artery of the foot. 4. There was no rupture of the elastic fibres as mentioned by Glogner. 5. In beriberi there was a slight thickening and fatty degeneration of the tunica intima of the large arteries, and a swelling and vacuolation of the endothelial cells was observed. 6. Thrombosis of the femoral artery was present in 2 out of 8 cases of beriberi, and marked tortuosity of the pulmonary vessels was found in 3 out of 8 cases. 7. The follicles of the spleen showed a hyaline degeneration in all cases of beriberi.

P. W. B.-S.

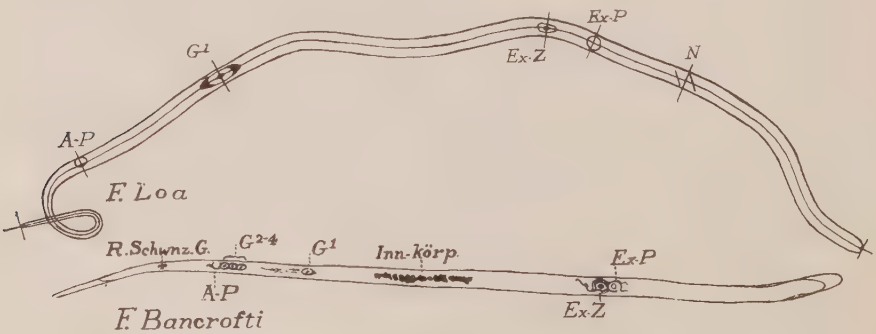
FILARIASIS.

Fülleborn (R.). **Beiträge zur Morphologie und Differentialdiagnose der Mikrofilarien.** [Morphology and Differential Diagnosis of Microfilariae.]—*Beihefte z. Arch. f. Schiffs- u. Trop.-Hyg.* 1913. Jan. Vol. 17. Beiheft 1. 72 pp. With 8 plates.

This very important paper brings our knowledge of the morphology and differential diagnosis of the human microfilariae to date and collects all that is known about the subject within a reasonable compass. As regards fixing methods, that of Looss, which consists of using 70 per cent. alcohol heated to 50 or 60° C., may be added to the older ones and the author's suggestion of quickly dried thin films is also a useful one.

Staining may be accomplished by (a) Vital staining with neutral red, (b) Staining with Azur II or (c) other methods, haematoxylin, etc.

After the finer anatomy of the head and cuticle has been dealt with, Fülleborn passes to the excretory organs. These are the *Exkretionporus* [excretory pore or V spot of the English]; the *Exkretionszelle* [excretion cell]; the *Analporus* [anal pore, genital pore or tail spot] and the *G. zellen* [G. cells or genital cells of Rodenwaldt]. The importance of these as landmarks for measurements will be detailed later. The tail part of the worm, the position of the cells in which is of importance, is mentioned in detail, as are also the length and thickness of the microfilariae, these being of course differential diagnostic characters of great value. The relative lengths of the anatomical fixed points in the different species are also very useful for differential diagnosis. Fülleborn proposes a scheme of measurement which seems to be a sound one and should be universally adopted. He takes the following points for making measurements from:—1. The middle of the nerve ring (N.) [this corresponds to the break in the continuity of the cells of the English]; 2. The middle of the excretion pore (Ex-P.); 3. The nucleolus of the excretion cell (Ex-Z.); 4. The nucleolus of the G^1 cell (G^1); 5. The middle of the anal pore (A-P.); 6. The termination of the last tail cells, haematoxylin staining. In addition the length of the hinder end of the red tail structure (*das rote Schwanzgebilde*) and the commencement and ending of the stained inner body (*Innenkörper* or central viscus) may be noted. The following diagrammatic sketches make these points clear:—



A table giving a comparison of the measurements of these points from the head, and also the distances between each point, in filarial embryos from the Island of St. Thomé, New Guinea, German East Africa, the Philippine Islands, and Samoa is appended. A comparison of some of these results would seem to show that the embryos from Samoa, the Philippine Islands, the Bismarck Archipelago and German New Guinea are all examples of *bancrofti*. Another table deals with the embryos of *Filaria loa* extracted from the uterus of the parent worm and embryos found in the peripheral blood by day, the so-called *Filaria diurna*. The differential diagnosis between the embryos of *bancrofti* and *loa* are next described. Some of these have already been noticed [see this *Bulletin* Vol. 1, p. 87 and pp. 417-419]. In addition to these, however, Fülleborn gives the following diagnostic points:—1. The G^1 cell of *loa* is recognisable by its large size, while in *bancrofti* it is much smaller; 2. By azur staining it is seen that the nucleolus of the excretion cell lies relatively far from the excretion pore in *loa* as compared with *bancrofti*; 3. In fresh living material, staining with neutral red brings out the Innenkörper or central viscus only in *bancrofti*, not in *loa*; 4. The percentage reckonings of the position of the anatomical fixed points give characteristic differences for the two embryos. For practical purposes Fülleborn thinks the following are sufficient for making a correct diagnosis.

——	*F. bancrofti.*	*F. loa.*
1. In thick, not too slowly dried haematoxylin preparations.	(*a*) Close spiral coils (*Windungen zusammengerollt*).	(*a*) Crumpled, in wavy lines (*zerknittert*).
2. In Azur II preparations	(*a*) G^1 cell relatively small.	(*a*) G^1 cell very large.

The differential diagnosis between the embryos of *Filaria perstans* and *Filaria demarquayi* may be made by the appearance of the tail. In the former the tail is blunt and the cells come up to the extreme end, while in the latter the tail is sharp and the extreme tip is free from cells.

A full bibliography is given. Futher tables deal with the measurements of the anatomical fixed points in microfilariae from different parts of the world, and there are eight plates (some coloured) of drawings of the filariae and their anatomical features mentioned in the paper.

C. G. Low.

Marotte & Morvan. **La Filariose au Bataillon de Sénégalais d'Algérie.**—*Arch. de Méd. et Pharm. Militaires.* 1913. Jan. Vol. 61. No. 1. pp. 1-66.

In a very long paper the authors give the results of their examination of a battalion of Senegalese troops in Algiers for filariae. Out of a total strength of 1,339 blacks (1,325, if 14

infants born in Algiers are excluded) 313 or 23·37 per cent. were found to be suffering from filariasis. In their work the authors had a certain amount of assistance from Cazanove, [see his paper on the same subject in this *Bulletin* Vol. 1, p. 82]. The three common species of filaria (*Filaria perstans*, *F. bancrofti* and *F. loa*) were encountered as the following table shows:—

Filaria perstans in 67 per cent.
,, *bancrofti* ,, 29 ,, ,,
,, *loa* ,, 0·9 ,, ,,
Mixed infections ,, 4·1 ,, ,,

Another table* gives the percentages of males and females infected, and the geographical areas from which the cases were recruited:—

		Sudan.	Upper Senegal and Niger.	Senegal.	Guinea.	Casamance.	Congo.	Ivory Coast.	Mauretania.	Various.	Total.
Men	Numbers ...	535	93	85	46	14	10	9	7	12	811
	Number with filariae.	169	22	25	16	13	7	3	6	2	263
	Per cent. ...	31	23	30	34	92	70	33	85	16	32·5
Women and children	Numbers ...	280	36	150	15	4	11	1	9	22	528
	Number with filariae.	29	6	5	1	2	1	0	3	3	50
	Per cent. ...	10·5	16·6	3·3	6·6	50	9	0	33	13·6	10·2

Different clinical manifestations due to *Filaria bancrofti* were noticed among the troops and the authors believe that *F. perstans* may also give rise to various troubles. A large portion of the paper is devoted to the manner in which the filaria is inoculated into man. The authors still believe, apparently, that the parasite may gain access by the ingestion of water, but do not bring forward any facts in support of this. The prophylaxis is also dealt with and a fairly complete bibliographical index completes the work.

G. C. L.

Meinhof (Heinrich). **Zur Klinik und Morphologie der Filaria und** *Mikrofilaria loa* (*diurna*). [Clinical and Morphological Study of Filaria and *Microfilaria loa* (*diurna*).]—*Beihefte z. Arch. f. Schiffs- u. Trop-Hyg.* 1913. Feb. Vol. 17. Beiheft 2. 58 pp. With 8 text-figures.

A very interesting clinical description of a case of *Filaria loa* infection is given. The description is specially instructive, because it covers a period of many years and so brings out features that otherwise might have been missed. The patient, a lady, born in Germany in 1878, went to the Cameroons as the wife

* Some of these percentages are obviously misleading, owing to the smallness of the figures

of a missionary in 1903. Four weeks after arrival she suffered from fever, probably malarial, and then again severely in 1905. After this attack multiple swellings, having all the characters of Calabar swellings, appeared. For the next years these swellings kept coming, headache was much complained of, and febrile attacks were frequent. In 1908 the heart, previously normal, became irregular. In May 1911 a male *Filaria loa* measuring 2 cm. in length was extracted from the left eye, *i.e.* six years after the first Calabar swellings were noticed. After this from time to time rigors with severe headache were complained of. In October 1911, the author made an examination of the patient in Tübingen, Germany, when he found a permanent acceleration of the heart's action with a slight enlargement of the organ to the left. No malarial parasites or filarial embryos were found in the blood; the eosinophiles were eight per cent. On the 15th of December a filaria about 1 cm. long appeared below the skin of the left upper eyelid but escaped before it could be removed. The blood at this date again showed no malarial parasites nor filarial embryos. On the 4th of January 1912, for the first time, *loa* embryos were found in the blood. A differential count of the leucocytes gave the eosinophiles as 22 per cent. On the 2nd of February 1912, a male adult two and a half cm. in length was removed from beneath the left conjunctiva of the left eye and on other days embryos were again found in the peripheral blood. Another worm, a female, was extracted in July 1912 and when the patient was last seen on the 25th of October 1912 swellings were still appearing.

If the date of the infection is taken as 1905, when the first Calabar swellings were noted, the first adult filaria appeared six years afterwards and embryos eight months after that, *i.e.* almost seven years from the beginning of the infection.

The second part of the paper deals with the morphology of the embryos and the anatomy of the male and female adults. Tables of measurements of the latter are given. The anatomy of the embryos and their points of distinction from those of *Filaria bancrofti* have already been fully dealt with in this *Bulletin* [see Vol. 1, pp. 417-419 and paper by Fülleborn above].

Some measurements are next given of the embryos of *F. perstans*, which were also found in the blood of the case and a very good and full account of the literature of the subject concludes the paper.

G. C. L.

Low (G. C.). *Filaria loa* **Cases: Continuation Reports.**—*Jl. Trop. Med. & Hyg.* 1913. Apr. 15. Vol. 16. No. 8. pp. 118-120.

The clinical histories of three of the five cases of *Filaria loa* infection reported upon in January 1911 and February 1912* are continued. They reveal the following interesting features:

Case III. (1911). Having spent the intervening year in a non-endemic part of Africa, this patient reported himself again in

* *Jl. Trop. Med. & Hyg.*, Vol. 14, p. 5 & Vol. 15, p. 38.

London on April 7th, 1913. During the interval sensations attributable to a filaria had been noted once near the left eye and once subcutaneously in front of the left ear. The blood showed no embryos, but the eosinophilia recorded in 1912 still persisted and amounted to 13·2 per cent.

Case IV. (1911). From February 1911 until June 1912 the patient had resided in the endemic area of Northern Nigeria in which he had originally acquired his infection. During this tour Calabar swellings developed five times on the back of the right wrist. The blood, examined on 3rd September, 1912, showed an entire freedom from embryos as on the previous occasion, but the eosinophilia had now increased to 17 per cent.

Case V. (1911) had shown no clinical features when reported upon previously, Low having accidentally found a number of embryos in the blood. When re-examined on 8th April, 1913, the patient complained of a little breathlessness and there was a suspicion of precordial pain with slight palpitation. The blood now showed an average of 39 as compared with 36 embryos per 20 cmm. The patient left the endemic area five and a half years ago.

Other points of interest emphasised by Low from his study of these cases are:—

(a) Infection apparently does not induce anaemia.

(b) The total leucocyte counts are not influenced.

(c) The eosinophile cells are increased absolutely as well as differentially and the eosinophilia is much more distinctly a high one than in cases of *F. bancrofti.*

R. T. Leiper.

Chyluria.

Coryllos (Pol) & Portocalis (A.). **Un Cas de Chylurie à Rechutes, très Probablement d'Origine Filarienne, sans Microfilaires ni Eosinophilie Sanguine. Examen Cystoscopique et Cathétérisme des Uretères.**—*Bull. et Mém. Soc. Anat. de Paris.* 1912. June. (58th year. 6th series.) Vol. 14. No. 6. pp. 264-273.

The patient had resided for many years in Egypt. At the age of twenty he had a chancre which was treated as a soft one; no secondary manifestations of syphilis appeared. In 1902, after a slight shivering fit, his urine became white like milk. A physician diagnosed chyluria and advised a sea voyage. Four days after embarking the chyluria disappeared and did not reappear again until 1909. In 1908 a sister of the patient also suffered from the same complaint. In 1909 a second attack, longer than the first, appeared. It was not preceded by any premonitary symptoms and the general health remained good during the whole duration of the crisis. Retention of urine owing to the coagulation of the urine in the bladder proved troublesome, however, and the viscus had to be washed out to evacuate the clots. In February 1912 a third relapse occurred and this one was specially studied by the authors.

The condition of the urine was fairly typical as regards colour and other characteristics but Brumpt who examined it chemically

and bacteriologically failed to find microfilariae. [This does not of course negative a filarial origin, as embryos are as frequently absent as present in such cases.] A further examination of the blood by the authors themselves showed no filarial embryos (day and night examinations) and a differential leucocyte count gave very scanty eosinophiles. Wassermann's reaction was negative. In view of the fact that the patient had had some ulceration of his legs some years previously and that after that a feebly positive Wassermann's reaction had been obtained in Hamburg, an intravenous injection of salvarsan was given. After this the urine became almost clear, but possibly the rest in bed was responsible for the amelioration of the symptoms quite as much as the drug.

Cystoscopy and catheterisation of the ureters was practised. The former revealed a normal mucous membrane as regards colour, but here and there, at the level of the trigone and on the anterior wall, were what appeared to be dilated lymphatics, sinuous vessels of irregular calibre, of a white colour, similar to those so often seen in the bladders of pregnant females. Catheterisation of both the ureters only gave clear urine, but as the urine from the bladder at this time also came clear it was not possible to say where the chyle was actually coming from, though the authors believe it was from the dilated lymphatic vessels in the bladder and not from the kidneys. Ludke (*Munch. Med. Wochenschr.* 1908 No. 26) has reported a similar case where the urine from both kidneys was normal and the chyle undoubtedly came from the bladder.

The authors then discuss their case as follows:—
(1) Was it a true chyluria? (2) What was the origin and cause of the chyluria? Finally they conclude that it was of filarial origin with disappearance of the adult filariae and consequent absence of microfilariae from the blood and urine and of eosinophilia in the blood.

[This explanation is in all probability the correct one. The death of the adults in filariasis is not uncommon and then the results of their previous presence only remain. In such a case embryos are of course absent from the urine and blood and no reason for an eosinophilia continuing exists. The fact of the patient's coming from Egypt is strongly in favour of *F. bancrofti* being the cause of the condition.]

G. C. L.

Lafforgue. **La Chylurie.**—*Jl. des Praticiens.* 1913. Mar. 1. Vol. 27. No. 9. pp. 129-130.

A typical case of chyluria is described. The patient, a native of Martinique, had had several attacks, the last ones being complicated with haematuria [haematochyluria]. Swelling of both testicles was present and a hydrocele on the right side. The method of Jousset, for the examination of chylous ascites, was applied to the urine with the following results. The urine cleared completely with Adam's liquid and with glycerine, partially with boiling alcohol and with alcohol and ether. The

suspended materials were completely insoluble in ether, chloroform, xylol and acetone. Heated with potash, almost complete clearing took place, the subsequent addition of ether causing the remaining suspension to disappear. These reactions, especially the one obtained with Adam's liquid, enabled the author to conclude that fatty matter—chiefly a neutral fat—was present in the urine. The total insolubility in xylol excluded lecithin. In addition albumin, globulin, and blood were present and microscopically a small number of cellular elements.

A rigid diet caused the disappearance of the chyluria, which reappeared again on the resumption of ordinary food. Fatty foods, such as lard and pork fat, always aggravated the condition and increased the output of fat. Alcohol also produced it, as did the addition of 150 grams of butter to an ordinary milk regime, which when taken alone was harmless (*régime achylurique*).

The author discusses the origin of the condition, but seems to be a little doubtful as to the *Filaria bancrofti* being the cause owing to the absence of embryos from the blood and urine. [This is quite common in such cases and is usually due to the death of the parent or adult worms. From the description of the case its filarial origin is clear, as is also the fact that the chyluria was a true one and not a lymphuria, the blockage being high up, probably in the thoracic duct itself.]

G. C. L.

Filarial Abscess.

Külz (L.). **Der tropische Muskelabszess (Myositis purulenta tropica).** [Tropical Muscle Abscess.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1912. May. Vol. 16. No. 10. pp. 313-324.

Intramuscular abscesses are very common in the Cameroons. In the author's list of operations at the hospital at Duala for 1907-8, out of 386 natives eighteen were operated upon for muscle abscesses and out of 86 Europeans five. In the years 1909-10, 4 Europeans and 11 natives were treated for this condition, and in Kribi (South Cameroons) in nine months 3 white people and 5 natives. The abscesses were usually of moderate size, about the size of a hen's egg, and from some pure cultures of *Staphylococcus pyogenes albus* were grown. Sometimes they were multiple, or in other instances new ones kept developing for weeks, or even months. In most of the Europeans treated the abscesses were single, whilst in the natives they were generally multiple. The youngest patient seen was fourteen years old. The differential diagnosis had to be made between muscular rheumatism, rheumatic swellings and Calabar swellings due to the *Filaria loa*.

As regards treatment, when pus forms it should be evacuated. After this the temperature falls to normal and the abscess soon heals. No fatal cases were met with in Europeans but two natives died: one of these also suffered from severe leprosy, the other from dysentery. The author believes that these cases of purulent myositis are really due to filarial disease. He suggests that *Filaria loa* is responsible. [It is much more likely that the condition is caused by *Filaria bancrofti*. In the reviewer's experience of *Filaria loa* infections in Europeans abscesses do not occur.

Again the fact of similar abscesses being found in the South Sea Islands and in other areas (British Guiana, West Indies, &c.) where *Filaria bancrofti* is common, but where *Filaria loa* does not occur, supports the view that the former parasite is the causative agent.]

G. C. L.

Wise (K. S.) & Minett (E. P.). **Report of Tropical Diseases Research in the Government Bacteriological Laboratory, British Guiana, for the Six Months October, 1911, to March, 1912.**— *Report of the Advisory Committee for the Tropical Diseases Research Fund for the Year* 1912. pp. 108-114. 1913. March. London: H.M. Stationery Office. [Cd. 6669.]

Filarial Abscess.—

Reference is first made to Maxwell's work published in the *British Medical Journal*, Sept., 1901, pp. 609-612. In his paper abscesses of the scrotum, limbs and of the abdomen and thorax were described. Out of 23 cases recorded, however, remains of adult *Filaria bancrofti* were found in one abscess only and so Maxwell was inclined to consider that some might be due to other causes than death of the parent worm, especially as regards abscesses of the scrotum. In all but the two last of his series filarial embryos were found in the peripheral blood at night.

Wise and Minett believe that the best evidence of these abscesses being filarial is undoubtedly the discovery of the adult worm in the pus. They therefore studied a series of deep-seated abscesses. These when opened were thoroughly washed out and all the contents completely evacuated, every drop of fluid and every shred of tissue being carefully collected. The whole of the material from each abscess was passed through a sieve of fourteen meshes to the inch and the resultant solid matter was washed thoroughly and teased out to find the worms. In several instances, more especially when the abscess was large, or of long standing or with much pus, no doubt the worm was absent because it had been destroyed by proteolytic digestion. Bacteriological examination of the pus was also carried out. The results are given in a table. Of 28 cases examined in 22 complete worms or pieces of worms were found. The authors believe that in the other six greater care or an earlier evacuation of the pus would have discovered the worm, and they have therefore no hesitation in saying that the adult *F. bancrofti* is a causative factor in these deep-seated abscesses. In 17 of the cases the abscess was the first pathological effect of the infection with *F. bancrofti*. In 7 instances filarial embryos were found in the pus and detritus removed from the abscess. As regards the bacteriology 21 abscesses showed streptococci in pure culture, four *Staphylococcus pyogenes aureus*, while three were sterile. It is pointed out that the death of an adult *F. bancrofti* does not necessarily lead to a filarial abscess, as has been shown by Wise in British Guiana and later by Bahr in Fiji. The death of the worm frequently leads to its calcification. The recurrence of these abscesses in the same patient is a common feature, several of the cases showing four or five scars indicative of previous

attacks. One patient who subsequently died of heart failure, had had seven abscesses, three in the calf of the leg and four in the thigh, one after the other in quick succession. In conclusion the authors state that it is probable that the abscesses of the spermatic cord described by Maxwell and the Endemic funiculitis of Castellani are similar conditions due to the *F. bancrofti*. So far they have not found genuine filarial abscesses, such as are seen in the limbs, in the abdomen or thorax.

G. C. L.

Wise (K. S.) & Minett (E. P.). **Report of Tropical Diseases Research in the Government Bacteriological Laboratory, British Guiana, for the Six Months April, 1912, to September, 1912.**— Report received in Colonial Office, Jan. 21, 1913.

Septicaemia and *Filaria bancrofti*.—

Reference is first made to previous reports relating to the connection between *Filaria bancrofti* and deep-seated abscesses in the limbs, and also to septic processes concerned with the lymphatics of the abdomen and thorax.

The exact nature of the relationship of *F. bancrofti* to septic processes such as abscess and septicaemia is a very interesting one. The condition which the authors now draw attention to is one of severe and extensive infection of the retro-peritoneal and retro-thoracic lymphatics. These lymphatics from the pelvic cavity to the region of the neck are filled with purulent matter containing streptococci of virulent character. Suppurating offshoots passing to the spermatic cord and testis, or to the glands in the groin, or by way of the axilla to the upper arm are also found.

Clinically, chilly feelings or definite rigors with pain in the abdomen form a common type of onset; occasionally rigor follows rigor in fairly rapid succession, though usually nothing more than the chilly ague fit is felt. The pain is not intense, nor does it cause much distress; usually when present it is greatest below the umbilicus and is increased by movement or pressure. The abdominal muscles are not hard and board-like but usually flaccid. The abdomen rarely becomes distended, tense, or tympanitic, because the peritoneal inflammation is usually limited to the posterior parts of the cavity. Vomiting is an early feature and sometimes occurs before peritonitis can have developed. Headache with delirium may also be seen. Death occurs in from two to eight days.

At the autopsy it is evident that the condition frequently follows suppuration of groin, axillary or cervical glands, filarial fever with lymphangitis of the leg or arm, suppurative lesions of the scrotum and cord, or deep-seated abscesses of the leg or arm.

The pathological anatomy is of a very peculiar and striking character. While certain parts of the pathological picture depend upon the particular area in which the suppuration commences, the central area to which all sooner or later converge is the retro-peritoneal or retro-thoracic lymphatics. Whether the inciting lesion is in the leg, in the epididymis, in the obturator region, in the groin glands, or elsewhere, the subsequent course is a slow progression of suppurative processes along the intervening

lymphatics to a final culminating infection of the retro-peritoneal or retro-thoracic lymphatics. An obvious mass of dilated lymphatics can be felt closely applied to the anterior and lateral aspects of the spinal column, and in this mass greatly hypertrophied lymphatic glands can be found. It may be impossible to trace any definite vessels but the main thoracic duct may usually be recognised. The vessels are all extremely thin-walled and markedly sacculated. The contents are either a brick-red fluid, reddish-white clot, or ordinary pus. In the thoracic duct the clot frequently becomes a pure white, more especially at the upper ending of the mass. In three out of fourteen cases *F. bancrofti* or its embryos were found in the abdominal mass. In each case the worms were discovered about the level of the kidneys. In no case was the adult filaria found in the thoracic duct obstructing the lymphatic flow at the upper end of the mass.

Smears of the material in the lymphatics and glands showed an enormous abundance of streptococci, and cultures bore out the extraordinary profusion of these organisms. Bacteriological examinations of thirty cases were carried out, and streptococci were observed microscopically in 28. In twenty instances they were isolated in pure culture and gave the characteristics of the ordinary *Streptococcus pyogenes*.

Stress must be laid, according to the authors, on the fact that the abdominal condition is a secondary one and that in every case with one exception the mass was connected with a similar lesion outside the abdominal cavity. The site of these has been described above.

The authors draw attention to somewhat similar cases described by Daniels and Conyers, by Low as fever and ague of the abdomen, by Maxwell and by Manson, and conclude that the adult filariae are the exciting cause of the condition. Other observations and experiments in British Guiana show that while the death of adults of *Filaria bancrofti* may not infrequently lead to abscess when situated in the limbs, spermatic cord, or epididymis, the death of this worm within the abdomen or thorax rarely or never results in such a condition. The most usual sites in which the worms are found in the abdomen are the lymphatic tissues about the aorta and vena cava, the lymph spaces beneath the epithelium of the pelvis of the kidney, the lymph spaces of the sheath of the ilio-psoas muscles and in Glisson's capsule. It is probable that they may wander to all parts of the abdomen but they are certainly most readily detected in the above areas. When found they are either alive or, if dead, in a process of calcification, which proceeds until the worm has shrunk to a small coiled, calcareous nodule, about the size of a millet seed. The natural ending of the parasite would therefore seem to be death with calcification. In the course of the last few years the authors have found filariae either living, calcified, or undergoing disintegration in an abscess, in the lymphatics of the following situations:—The pelvis of the kidney (31 times), the epididymis (18 times), the retro-peritoneal tissues (12 times), the ilio-psoas muscles (4 times), Glisson's capsule (twice), inguinal glands (25 times), lymphatic vessels (8 times).

[There seems to be very little doubt that the filaria is the exciting cause of the condition just described. Suppurative lesions were also found to be very frequent by Bahr in filarial cases in Fiji. The parasite, in some way or other, damages the lymphatics and so produces a condition favourable to the invasion and growth of micro-organisms.]

G. C. L.

Schumacher. **Eitrige Funikulitis.** [Purulent Funiculitis.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1913. Jan. Vol. 17. No. 1. pp. 18-19.

The patient was admitted into hospital complaining of pain in the right inguinal region and right testicle. His temperature was 39·2° C. The spermatic cord on the right side was thickened and swollen as was also the testicle. The swelling was very sensitive to pressure, and the skin over it showed commencing inflammation. The patient had had two similar attacks previously, a month and six months before. Schumacher operated and found a gelatinous and mucoid condition of the cord like that seen in chronic elephantiasis, with in addition acute inflammatory changes and multiple abscesses, the latter being found in the testicle also. The testicle and the cord were removed, healing was rapid, by first intention and the patient left hospital twenty days after the operation. In discussing the etiology of the condition the author suggests gonorrhoea as the cause.

[A similar condition has been described by Castellani in Ceylon under the name "Endemic funiculitis." It is very likely that *Filaria bancrofti* is the real cause, ordinary cocci bringing about the suppuration as is so often seen in other filarial lesions.]

G. C. L.

Elephantiasis.

Gravot. **Un Cas d'Eléphantiasis complet du Scrotum et du Fourreau. (Oschéotomie avec Anaplastie.)**—*Ann. d'Hyg. et Méd. Colon.* 1912. Oct.-Nov.-Dec. Vol. 15. No. 4. pp. 868-872.

A description of an ordinary case of elephantiasis of the scrotum with the operation for its removal is given. The disease is not common in the province of Fort-Dauphin, Madagascar, where the case occurred, though other forms of filariasis such as hydrocele and haematocele are frequently seen.

Haemorrhage proved troublesome at the operation. The wounds healed slowly and, owing to indiscretions on the part of the patient, signs of the condition relapsing became evident during his last fifteen days' stay in hospital.

G. C. L.

Müller. **Zur Operation der Elefantiasis der männlichen Genitalien.** [On Operation for Elephantiasis of the Male Genitalia.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1913. Apr. Vol. 17. No. 8. pp. 269-272.

The author describes the operative technique adopted by him in cases of elephantiasis of the scrotum and penis. The day

before the operation the parts are suitably cleansed and next day, twenty minutes before and again just before the commencement of the operation, are painted with ten per cent. official tincture of iodine.

A hollow sound is first introduced into the sac of the foreskin and a long incision is made in the middle line dividing the tissues covering the glans. The incision is now lengthened along the course of the penis, the proximal part of which is freed and then sound skin as far as possible is brought into relationship with it in order to form a covering.

The search for the testicles and their separation from the swollen mass is accomplished by a single oval incision. The upper pole of the oval coincides with the upper angle of the wound, the lower lies in the raphe of the perineum, as far removed from the anus as possible. The long aspects of the oval pass on the sides of the scrotum, encircling, so to speak, the tumour mass. They are then carried downwards to the depth of the testicles and cord, these latter structures, after being dissected out, being wrapped up in saline compresses for the time being. The tumour mass is then removed, bleeding points are stopped as far as possible, the incisions are united,—parts where this is not feasible being allowed to granulate—and drainage is provided for.

Three patients have been operated upon by this method with very satisfactory results.

G. C. L.

Barnes (Noble P.). **Filariasis; Report of Case Treated with Dioxydiamidoarsenobenzol.**—*Monthly Cyclopedia & Med. Bull.* 1913. Jan. Vol. 6. No. 1. pp. 1-7. With 4 figs.

The author describes a case of elephantiasis treated by salvarsan. Two injections were given, the second three months after the first. From the photographs illustrating the paper it would seem that the condition had been greatly benefited.

[Why this should be is not clear and as meagre details only are given it is impossible to draw any conclusions from them. The statement that microfilariae were found in the patient's stools is manifestly erroneous.]

G. C. L.

Acosta-Sison (Honoria). **Elephantiasis Glabra Congenitus with Report of a Case.**—*Bull. Manila Med. Soc.* 1912. Dec. Vol. 4. No. 12. pp. 196-198.

Congenital elephantiasis is a very rare condition, so the report of the above case is of great interest.

The child, a male, was born healthy and robust, but with the left lower extremity from Poupart's ligament to the ankle joint, including the buttock, very much enlarged. The skin of the affected extremity was somewhat indurated and did not pit on pressure. Two years later the hypertrophy of the left lower extremity had slightly increased and had extended upwards to the left side of the lower abdominal wall and downwards to the

dorsum of the left foot. The glans penis was also much enlarged and had reached the size of a large cherry.

Three possibilities, according to the author, must be considered in the diagnosis of the affection, viz.:—(1) lipomatosis, (2) obstruction of the left common iliac vein, and (3) obstruction of the lymphatics in the region of the left common iliac glands.

In lipomatosis, however, the hypertrophy is usually bilateral and is usually greater in regions where there is normally an abundance of fatty tissue. In obstruction of the left common iliac vein, the oedema is usually soft and the superficial veins are dilated. Such being the case, the condition was evidently due to some obstruction in the lymphatics, but what the nature of that was could not be determined. In ordinary acquired elephantiasis the most common variety is that which results from lymph stasis produced by any factor that causes obstruction to the lymph vessels, such as *Filaria bancrofti*; chronic lymphangitis; erysipelatous or eczematous inflammation of the skin involving the lymphatics; lupus; syphilis; varicose ulcers; frost bite; traumatism, etc. Removal or destruction of the regional lymph glands has also been known to cause elephantiasis of the part tributary to the glands. The parts may be hard and indurated (elephantiasis dura), soft and pitting on pressure (elephantiasis mollis), the epidermis may be smooth (elephantiasis glabra), papillary or warty (elephantiasis verrucosa) or nodular (elephantiasis tuberosa). The legs and external genitals are most frequently involved though the disease may occur in any superficial part of the body.

[A subsequent history of this interesting case would be of value.]

G. C. L.

Bevacqua (Alfredo). **Fuso-spirillare Assoziation in einem Falle von Pseudo-elephantiasis des unteren linken Gliedes bei einem Araber.** [Fuso-spirillar Association in a Case of Pseudo-elephantiasis of the left lower Limb in an Arab.]—*Centralbl. f. Bakt.* 1. Abt., Orig. 1913. Mar. 1. Vol. 68. No. 2. pp. 182-188. With 3 figures.

The case was seen in Tripoli. The condition was a chronic one, having lasted for years and was said to have followed an injury to the foot. Bacteriological investigations showed many organisms, amongst these spindle formed bacilli somewhat similar to the fusiform bacillus of Vincent, and in addition numerous spirilla, with two or three spirals, resembling the *Spirochaeta refringens* found in the mouth. There were no signs of leprosy or tubercle bacilli. A photograph of the affected limb, a microphotograph of the organisms and one of a section of the tissues are given. In the latter giant cells appear to be present. [The bacilli present are probably only secondary contaminators and have nothing to do with the original cause of the disease.]

G. C. L

Daniel (C.). **Die Elephantiatische Tuberkulose der Vulva.** [Tubercular Elephantiasis of Vulva.]—*Monatsschr. f. Gebürtshilfe u. Gynäkologie.* 1913. Jan. Vol. 37. No. 1.

A case of this rare condition is described while seven others are quoted from the literature. In coming to a diagnosis other causes of elephantiasis, such as filariasis and syphilis, have to be excluded. If the patient has never lived in the tropics filariasis may be put out of court. The author recommends excision for the treatment, but in the majority of cases the disease recurs and general tuberculosis may appear.

G. C. L.

Sézary (A.) & Salès (G.). **Eléphantiasis bacillaire.**—*Rev. de Médecine.* 1913. Feb. 10. Vol. 33. No. 2. pp. 111-115.

A non-tropical case of elephantiasis is described. [These cases though rare, crop up occasionally. See this *Bulletin*, Vol. 1, pp. 93 and 94.] The condition was a unilateral one and followed chronic tubercular disease of the knee, other signs of tubercle being present in the lungs and elsewhere. The authors therefore classify their case as one of bacillary elephantiasis. [Any chronic infection, especially if associated with extensive fibrosis, may block the lymphatics and so cause elephantiasis.]

G. C. L.

Dracontiasis.

Bouilliez (M.). **Orchite due à la Présence d'un Ver de Guinée dans le Testicule.**—*Ann. d'Hyg. et de Méd. Colon.* 1912. Vol. 15. No. 4. pp. 872-875.

The clinical details which accompany the record of this case illustrate very strikingly the difficulties of diagnosis which may present themselves where a large parasite like the guinea-worm is traversing deep seated and vital organs and the permanent damage which may follow upon such wanderings.

The patient, a sergeant in the French Colonial Infantry, was suddenly taken ill with fever and with pain in the abdomen, the cord and the left testicle. The cord was hard and very painful. Micturition was frequent but painless, the urine contained a large quantity of pus but no blood. Drops of pus came away in the intervals of micturition. The fever, with nausea and vomiting, increased for the succeeding two days; then the urine cleared and no longer contained pus; a little could, however, be obtained at the meatus by pressing along the course of the urethra. At the same time the cord had become less hard and painful, but the left testicle had enlarged to three times its normal size. When the patient was seen by Bouilliez, seven days after the onset of the illness, the fever had completely subsided: there was no vomiting or nausea. The urine was clear and the urinary meatus dry. The testicular cord had regained its normal consistence, but was still tender. The testicular mass was swollen, hard and very painful. One spot, above and below, seemed slightly softened but neither more nor less painful than elsewhere.

The usual treatment for orchitis: an ointment of mercury and belladonna; light compression by means of wad-dressings; a suspensory bandage, etc., was adopted. This treatment greatly relieved the symptoms, although the testicular condition remained practically unchanged. After fifteen days, accompanying intense itching, a small vesicle formed at the soft spot noted previously in the testicular mass and a guinea-worm appeared. By slight traction this was extracted and was found to be sixty cm. long. The tiny wound healed in three days.

Following upon the extraction of the guinea-worm the testicle began to atrophy and five months later scarcely exceeded a large haricot bean in size. The author discusses, in the form of a series of interesting questions, the probable course followed by the guinea-worm from the neck of the bladder to the interior of the testicle.

R. T. Leiper.

Roubaud (E.). **Observations sur la Biologie du Ver de Guinée: Infection intestinale des Cyclops.**—*Bull. Soc. Path. Exot.* 1913. Vol. 6. No. 4. pp. 281-288.

This memoir contains several important additions to our recent knowledge of the bionomics of the guinea-worm and its development in Cyclops.

Survival of embryos.—In no instance did guinea-worm embryos survive for longer than five days. Taken fresh from the female they only lived three days in water and four days in moist earth in Dahomey when the mean temperature was 25° C. Nor could any appreciable capacity of resistance to desiccation be demonstrated.

Manner of infection of Cyclops.—Roubaud discards the generally accepted view that the guinea-worm embryos infect the Cyclops by actively penetrating into their bodies through the cuticular skin and maintains that he has experimentally confirmed the view hitherto held alone by Leiper that the *infection is intestinal.* Fedtschenko stated that embryos ingested by the Cyclops were killed by the stomach juices, but Roubaud affirms that the Cyclops swallow dead as well as living embryos.

The following experiment is detailed in support of the theory of intestinal infection. A large number of Cyclops were placed in water rendered cloudy with embryos. Six hours later the bulk of the Cyclops examined showed voluminous groups of embryos in the region of the stomach. The worms were active and did not by any means appear to be digested. In the fresh material no embryos could be detected in the general body cavity at this stage, but in sections some embryos can be seen already, in some instances, in the body cavity alongside of the stomach group. In those Cyclops examined after 24 and 48 hours no embryos could be found in the digestive tract: all had passed into the body cavity. If the embryos had been digested one would have expected to find traces of cuticle in the intestinal content.

Another new observation of interest is that the nauplius larva of the Cyclops is also susceptible of infection. Roubaud states that to find three or four embryos in a single nauplius is not rare.

Ecdysis.—In Dahomey the first sheath forms on the eighth day. This is a minimal period for even on the tenth day one may find even in the same Cyclops some embryos which have their primitive characters. By the fourteenth day the larvae have assumed the appearance of the second stage. The sharp tail of the new born embryo has given place to one short and blunt. The striation of the cuticle is much less apparent but still visible. The larva is cylindrical and now measures 0·5 mm. The movements are much less rapid than in the first stage. Larvae 42 days old show the following features. Size has increased to 0·6 mm. The mouth has two distinct lips. The posterior third of the body is now distinguished by a yellowish brown colouration [due doubtless to pigmentation of the wall of the intestine]. The early mobility has completely disappeared and they lie coiled up in their host. No terminal papillae could be made out at the posterior end of the body. The tail is simply conical not trilobed.

Infection experiments were made upon three monkeys (*Cercopithecus viridis*) with (1) embryos taken fresh from the uterus of a mature worm, (2) a dozen Cyclops infected 48 hours previously, and (3) fifteen Cyclops infected for a fortnight. None of these were found infected at the autopsies made several months later. No experiments were made with Cyclops infected during a period of six weeks.

Seasonal incidence.—In Dahomey dracontiasis is most frequent from December to February, the driest months of the year. The persistence of endemic dracontiasis seems to be the result of a complex equilibrium between (*a*) the time necessary for the annual development of the worm in man, (b) the regular periodic recurrence of the seasonal conditions, and (c) those conditions of human existence which favour its transmission by the Cyclops. The geographical distribution of the guinea-worm is determined by the local fulfilment or otherwise of these three essentials.

R. T. L.

Unclassed.

Degorce (A.). **Le Traitement Chirurgical du Varicocèle Lymphatique.**—*Bull. Soc. Méd.-Chirurg. de l'Indochine.* 1913. Jan. Vol. 4. No. 1. pp. 39-45.

Lymphatic varicocele is comparatively rare in Tonkin, Degorce only having had occasion to operate in three cases in the course of ten years' hospital practice in Hanoi. During that time a greater number of cases were seen, but these were either unsuitable for operation, or the patients refused surgical treatment. The results, in the three cases mentioned above, were not very brilliant. In one, who suffered from a double lymphatic

varicocele, extirpation was performed on the right side, but this was followed by the onset of chyluria and a bad general state. In another, some days after the operation, the lymphatics of the testicle dilated, though this symptom had not been present before the excision, while in the third the scrotum remained infiltrated, oedematous, and tender to pressure. As Degorce himself says, these dilated lymphatics are only a part of a general dilatation which may extend up on the posterior aspect of the abdomen as high even as the thoracic duct, and therefore their removal cannot in any way influence the cause of the condition. Unless the patients are suffering great pain and have hydrocele and hernia as well, Roy des Barres believes the condition is best left alone. As complications that observer has noted two cases of lymphorrhagia. Clarac has also drawn attention to the danger of producing haematochyluria after such operations.

The technique of the operation itself is simple. Degorce and Roy des Barres open the inguinal canal and resect the dilated lymphatics from the superior extremity of the testicle to the internal ring. Hernia, if present, is dealt with and hypertrophied lymphatic glands are removed. The spermatic artery can be recognised by its pulsation and red colour, the veins are bluish, while the lymphatics are grey and of a doughy consistence. In some cases the artery can be easily isolated from the other constituents of the cord, but in others it may be practically impossible to separate it and then it may have to be ligatured. In the latter case, however, there may be a danger of consequent atrophy of the testicle. If hydroceles exist they should be dealt with by resection of the tunica vaginalis and if the scrotum is soft and baggy (lymphscrotum) it may be partially resected and so reduced in size. After this the inguinal canal is reconstituted by suturing, drainage being allowed for in some cases, in others not.

G. C. L.

Bluel (Adolphe). **Contribution a l'Etude de la Filariose de Demarquay.**—*Université de Bordeaux. Thèse pour le Doctorat en Médecine.* (No. 110.) 1912. 66 pp. Bordeaux: Imprimerie Barthélemy & Clèdes.

The author bases his thesis on a case of ordinary filariasis, lymphangitis of groins, and orchitis, from Guadeloupe. In addition to these manifestations of *Filaria bancrofti* infection, the patient had embryos of *F. demarquayi* in his blood [i.e. suffered from a double infection]. Frequent attacks of lymphangitis were complained of these occurring every few months. Salvarsan was given and since the injection of this drug no further attacks had appeared up to eleven months afterwards. The author gives a description of *F. demarquayi* in which he quotes largely from the writings of Daniels, Low and others on the subject. [The patient came to France from Guadeloupe to finish his education. If it should turn out that he had never been out of that island before, a fact which is not stated, this would mean that Guadeloupe is

another West Indian Island in which *F. demarquayi* is endemic. This important point is not brought out in the thesis nor the apparent fact that the patient was suffering from a double infection.]

G. C. L.

King (Arthur). **A Case of Filariasis in Devonshire.**—*Brit. Med. Jl.* 1913. May 24. p. 1108.

The author believes that he has discovered a filaria in the vaginal discharge and blood of a girl who had never been out of Devonshire.

[No details are given. Such discoveries have been made in England before but have never been confirmed.]

G. C. L.

MISCELLANEOUS.

i. Scott (H. Harold). **Fulminating Cerebro-Spinal Meningitis in Jamaica.**—*Ann. Trop. Med. & Parasit.* 1913. Mar. 31. Series T. M. Vol. 7. No. 1. pp. 165-181.

A Report by the Government Bacteriologist on Cases of Cerebro-Spinal Meningitis, indicating the Similarity between the Symptom-Complex of that Disease and some Cases of Vomiting Sickness.—7 pp. F'cap. 1913. Jamaica: Government Printing Office, Kingston.

ii. Potter (T. J.). **Report on Vomiting Sickness in Jamaica.**—*Report of the Advisory Committee for the Tropical Diseases Research Fund for the Year* 1912. Appendix vii. pp. 172-198. 1913. London: H. M. Stationery Office.

i. A disease known by the name of vomiting sickness prevails in Jamaica. Scott, the Government Bacteriologist, suggests that it is really nothing more nor less than fulminating cerebro-spinal meningitis. Several official reports have already appeared on the subject. On the 4th September 1912 a sudden outbreak of a very acute nature occurred in Kingston itself and these cases were specially investigated. The following is the author's summary of what he found:—

"1. In four cases presenting the typical symptoms of 'vomiting sickness' the Weichselbaum's diplococcus has been isolated.

"2. These symptoms correspond to those associated with foudroyante types of cerebro-spinal meningitis.

"3. The organism was obtained from the cerebro-spinal fluid of all those from whom this fluid was taken during life, and from the cerebral ventricular fluid post mortem.

"4. The organism was obtained from the naso-pharynx of one of the contacts of these cases, though himself apparently in perfect health.

"5. The intracranial post-mortem signs were such as are consistent with death from cerebro-spinal meningitis at such an early stage, that is, with fulminating cases of the disease."

"This focus did not spread, and the child who was proved to be harbouring the organism in his naso-pharynx did not develop the disease."

Later, in October, 1912, more cases occurred in Kingston, and these also were specially studied. The general conclusions arrived at are as follows:—

"1. In several cases of illness with sudden onset in apparently healthy subjects, terminating fatally in a high percentage of those attacked, I have isolated a Gram-negative diplococcus from the spinal fluid.

"2. This organism gives the morphological and cultural characters of Weichselbaum's *Diplococcus intracellularis meningitidis*, except that in galactose it does not always give a definite reaction, the medium in some instances not being affected. The maltose and dextrose, however, are always typically acted upon.

"3. These cases exhibit in many instances a symptom-complex which has for years been spoken of in Jamaica as 'Vomiting Sickness.'

"4. The disease breaks out in localised epidemic form in various parts of the island every cold weather, that is, from about the middle of December to the end of February or beginning of March.

"5. The disease occurs at other times as sporadic cases, but apparently does not spread extensively.

"6. It is a curious thing that practically all the cases are of the hyperacute variety, either recovering in a few days, or dying in a few hours. One rarely sees the subacute cases during the epidemic times, and never, so far as I am aware, the chronic ones, unless some of the natives one meets with who are chronically deaf, or have seriously defective vision, or who suffer from fits, are instances of cerebro-spinal meningitis with permanent sequelae. Of this there is no proof.

"7. In two instances a spirochaete-like body, or long curving bacillus, has been seen in the smears made directly from the fluid obtained by lumbar puncture. What part, if any, this takes in producing the symptoms I have had no means of discovering.

"8. The disease is very rare amongst the white population; I have known of only three instances so far during the past year. Possibly this is due in part to better hygienic conditions, less crowding, and so forth, but not entirely, because

"9. I have not personally met with the condition once amongst the East Indian population, where overcrowding and bad hygiene are nearly, if not quite, as marked as in the case of the native. For this, also, I am unable to offer any explanation at present, though it may be noted that the food supply of the East Indian is usually better than that of the West."

ii. Potter, in discussing the subject, states that the condition diagnosed as cerebro-spinal meningitis in the past is the same as that now diagnosed as vomiting sickness. Places where cerebro-spinal meningitis, occurring almost exclusively among young children with a very high case mortality, used to appear are exactly those in which the so-called vomiting sickness is now got. He believes that had these cases been cerebro-spinal meningitis some would have run a more prolonged course, sequelae such as paralysis, blindness and deafness would have followed, and post mortem examinations would have shown definite inflammatory changes in the meninges.

Ptomaine poisoning, ackee poisoning, and cassava poisoning have all been at various times recorded as the cause of vomiting sickness.

The author then tries to show that up to the year 1904 yellow fever was looked upon as endemic in Jamaica, and post mortems made by himself as well as those collected from reports leave no doubt in his mind that it is still endemic. He states that it is significant that one of the popular alternative names for vomiting sickness is black vomit and that it is remarkable that in countries where yellow fever is admitted to be endemic—Brazil, Peru, and Mexico—there is a disease described, in every way similar to the vomiting sickness of Jamaica. Children are mainly attacked, the onset is sudden, vomiting is a prominent symptom, and the vomit is frequently haemorrhagic, sometimes black. The case mortality is high and in each country there exists the same desire to avoid calling the disease yellow fever. Potter also considers it of interest that, among all the explanations of the cause of vomiting sickness, yellow fever has never been suggested, and this in spite of the fact that one of the popular terms for the disease is black vomit.

An appendix gives a list of the cases seen, 70 in number, and also of the post mortems made. The conclusion is that there is no justification for the use of the term vomiting sickness. The disease is not a separate clinical entity and the author is of opinion that the majority of the deaths ascribed to it are due to yellow fever.

[It is not quite easy to reconcile the definite conclusions reached by Scott and Potter, unless one believes that both epidemic cerebro-spinal meningitis cases and yellow fever ones have, in the past, been mistaken for vomiting sickness. Certainly some of the post mortems of Potter's cases are extremely suggestive of yellow fever, while similarly there seems to be no reasonable doubt about the diagnosis of epidemic cerebro-spinal fever in Scott's cases.]

G. C. Low.

Löhlein (M.). **Beiträge zur Pathologie der Eingeborenen von Kamerun. iv. Übersicht über die Ergebnisse von 140 Sektionen in Duala 1910 und 1911.** [A Summary of the Results of 140 Autopsies in Duala, Cameroons, 1910 and 1911.]—*Beihefte zum Arch. f. Schiffs- u. Trop.-Hyg.* 1912. Nov. Vol. 16. Beiheft 9. pp. 91-109. [727-745.]

The principal diseases which caused death in the 140 cases were as follows:—

	No. of cases.		No. of cases.
Abscess of Liver ...	4	Malaria	7
Aneurism	1	Meningitis	6
Ankylostomiasis ...	4	Peritonitis	1
Cirrhosis of Liver ...	4	Pneumonia	28
Beriberi	2	Sarcoma	1
Bronchitis	1	Sleeping Sickness ...	3
Endocarditis	2	Smallpox	2
Enteritis	1	Surgical	12
Dysentery	28	Tubercle	12
Leprosy	1	Typhoid	10

Various:—Suicide, Cellulitis of leg, Suppurative Parotitis, Noma, Hyperaemia and Oedema of lungs (two cases), Purulent arthritis, Rupture of spleen (two cases).

Examinations made at the autopsy for animal parasites showed that ankylostomes, trichocephalus and other intestinal parasites were very numerous. In addition, porocephaliasis was found to be not infrequent, ten cases being noted in the above series.

From the table it will be seen that dysentery and pneumonia were the most common cause of death; typhoid, tubercle and malaria coming next in frequency. [Interesting statistics of post mortems such as the above should prove of value to workers in the tropics.]

G. C. L.

Masterman (E. W. G.). **Notes on some Tropical Diseases of Palestine.**—*Jl. of Hygiene.* 1913. Apr. Vol. 13. No. 1. pp. 49-62. With 1 chart.

Malaria is very common in Jerusalem. The Anopheline host breeds in the numerous cisterns throughout the town. Mühlens states that this is the *Anopheles bifurcatus*. Cropper (1902) has shown that four species of Anophelines are found in Palestine,

viz.:—*Anopheles maculipennis*, *Pyretophorus palestinensis*, *Myzorhynchus pseudopictus* and *Cellia pharoensis*.

Haemoglobinuric (blackwater) fever is now well known in Palestine. It cannot be called common in Jerusalem, but every autumn a few cases occur amongst patients who have not been outside the city for years. In the maritime plain, around Jaffa, and in the malarious regions near Caesarea, it is far from uncommon. The worst region of all is the Jordan Valley near Lake Huleh and south of the Sea of Galilee, in both of which places many people have succumbed and others have been reduced to states of extreme anaemia.

Dengue prevails throughout Palestine. During the autumn months of 1912 a severe epidemic raged in Syria. The last epidemic in Jerusalem occurred in 1889, but in Jaffa and along the coast the disease is frequent. In making the diagnosis of dengue two other diseases, besides malaria, have to be excluded, viz.:—influenza and three-day fever. The author states that Graham's original idea that the carrier of the disease is a mosquito is a correct one, but he does not know of any evidence that proves that *Culex fatigans* is necessarily the only carrier.

[Other tropical conditions in Palestine would appear to be rare; at least, they are not mentioned in the article.]

G. C. L.

Santamaria (J. Martinez). **Some Notes on Tropical Diseases observed in the Republic of Colombia.**—*Jl. Trop. Med. & Hyg.* 1913. Apr. 1. Vol. 16. No. 7. pp. 100-102.

The author writes a short note upon certain tropical diseases found in Bogota, Colombia. These are similar to those found in other parts of the world; for example, yaws, pinta, leprosy, yellow fever, relapsing fever, malarial fever, blackwater fever, tropical splenomegaly, beriberi, dysentery, ankylostomiasis and other forms of helminthiasis, piedra, etc. The Spanish name of these with a short description of each is given.

G. C. L.

Whitmore (A.). **An Account of a Glanders-like Disease Occurring in Rangoon.**—*Jl. of Hygiene.* 1913. Apr. Vol. 13. No. 1. pp. 1-34. With 1 plate and 2 charts.

Some of the work in this paper has already been referred to (see this *Bulletin*, Vol. 1, p. 588). The author now goes into the subject in greater detail and gives a short account of 38 cases in which he has isolated his glanders-like bacillus. The pathological lesions are also described, patches of consolidation in the lungs being one of the principal of these. The lesions are often so peculiar in appearance, as at once to suggest that none of the usual pathogenic bacilli could have been responsible for their production. Further it is stated that if guinea-pigs be fed with food or drink contaminated with pure cultures of the new bacillus the animals speedily die, and after death, not only can the bacilli be easily recovered from their organs, but also lesions are present in every way similar to those found in the human subject.

The human disease is characterised by the presence of the bacillus and the definite lesions. Its nature is that of a pyaemia or septicaemia clinically resembling glanders, but according to the author the distinction between the two diseases is easy if a proper bacteriological examination is carried out. Confusion may arise if Strauss's guinea-pig testicular reaction is relied upon (*loc. cit.*).

Clinically, knowledge of the disease is scanty and only a suspicion of the infection can be entertained on clinical signs alone. It seems to be specially prevalent amongst morphia injecters.

G. C. L.

Investigations of Rocky Mountain Spotted Fever.—*Annual Report of the Surgeon-General of the Public Health Service of the United States for the Fiscal Year* 1912. pp. 28-30. 1913. Washington: Government Printing Office.

In the Report for 1911 a description was given of investigations on Rocky Mountain spotted fever carried out from May 12 to August 7, 1911. Passed Asst. Surg. T. B. McClintick began these studies again on April 1st, 1912, and, as in the previous year, the methods adopted were:—(1) Tick extermination by (a) dipping of domestic stock and (b) killing of small wild animals; and (2) Laboratory investigations. From April 1st to July 1st, 1912, 402 horses, 851 cattle, and 157 sheep were dipped. It is proposed for the future to dip the stock early before the ticks appear and then afterwards once a month.

War was waged against small mammals, the commonest of which was the Columbian ground squirrel, *C. columbianus*. In addition to this species other small wild mammals, such as pine squirrels, chipmunks and woodchucks are hosts for feeding and developing the larval and nymphal forms of the tick. Poisoning and fumigating with carbon bisulphide proved very efficient in the work of extermination.

In the laboratory, investigations were made to study the susceptibility and immunity of some of the wild mammals to spotted fever infections. These were inoculated with the virus of the disease and then about five days later inoculation of their blood was made into guinea-pigs. The mammals used were as a rule caught in territories badly infested with ticks. 175 ground squirrels, 20 woodchucks, 1 coyote, 12 rock squirrels, 1 mountain goat, and 1 wood rat were examined. The experiments have not yet reached the stage at which definite results can be reported. 150 ticks collected in the State of Idaho, where spotted fever is very prevalent in mild form, were placed on guinea-pigs, but none of the animals developed the disease.

At the close of the season McClintick, unfortunately, became infected himself, presumably in his laboratory, and died of the disease after an illness of six days.

G. C. L.

Paranhos (Ulysses). **Considérations sur le "Mal d'Engasgo."**—*Bull. Soc. Path. Exot.* 1913. Jan. Vol. 6. No. 1. pp. 47-50.

"Mal d'engasgo" or "entalaçâo" is an endemic affection found in certain regions of Brazil. It is characterised by difficulty of swallowing, which may become so complete as to prevent the ingestion of food and cause inanition and death. The disease has been known for a long time in the states of Parahyba, Bahia, Minas, Goyas, Matto-Grosso, and Sao-Paulo.

What causes the obstruction is not quite clear. It may be due to a spasm of the lower part of the oesophagus preventing the passage of the bolus of food into the stomach. There is no organic stricture, as the oesophageal bougie passes freely into the stomach. Radioscopy reveals nothing. The oesophagus in some cases is dilated. The diagnosis is not difficult and the differentiation from organic stenosis and hysterical spasm is easy. The prognosis is always bad, the patients generally becoming cachectic and liable to intercurrent affections; the duration of the disease varies greatly, lasting for months or years. The treatment is purely symptomatic. Bromides, chloral, opium, and injections of iron and arsenic have been tried. The pathological anatomy has not been worked out, no autopsies apparently having been made. Some believe that the condition, for which the author proposes the name "*Dysphagie tropicale*," is essentially a neurosis.

Bouchard has stated that the symptoms of this disease as seen in Brazil are very similar to those of a disease of pheasants in France, due to the presence of worms in the oesophagus. Others suggest that the condition might be a clinical variety of the trypanosomiasis of Chagas, while others believed that the cause might lie in an intoxication by manioc. The prolonged ingestion of this substance seems to set up motor disturbances, dysphagia, convulsions, cardiac feebleness and death with arrest of respiration. In making flour from manioc the toxic principle is destroyed by the action of heat but if the process is insufficiently carried out enough might be ingested to cause toxic symptoms.

[More research on this interesting condition is manifestly required.]

G. C. L.

Gabbi (U.). **La "Fièvre Boutonneuse" à Tripoli.**—*Malaria e Malat. d. Paesi Caldi.* 1913. Mar. Vol. 4. No. 2. pp. 65-68.

Attention is drawn to a febrile infection of unknown etiology, which is characterised more by its particular exanthem than by any special course. A complete and incomplete history of two cases is given. The clinical symptoms of both of these correspond closely to the descriptions given by Conor and Bruch of a disease in Tunis, to which the name of *Fièvre boutonneuse* has been given. This peculiar malady is characterised by:—

1. An eruption which appears on the trunk and limbs on the second or third day and consists of a red staining or mottling,

the spots being of the size of a lentil, often of unequal dimensions, and having an indurated base. These give the impression of being raised, but this is not borne out when they are touched, an observation first made by Banchi. They are not painful, nor itchy, and may affect the palms of the hands or soles of the feet. After the fall of the fever they gradually disappear and leave a slightly pigmented trace behind.

2. An occasional exanthem of the buccal mucous membrane.

3. The temperature, which rises suddenly with rigors, sometimes associated with vomiting and cerebral phenomena.

4. Muscular and periarticular pains often of great severity.

The malady lasts from ten to fourteen days and is not accompanied by disturbances of the circulatory, respiratory or urinary systems. Relapses do not occur and the prognosis is a good one. Cases appear in the autumn.

Gabbi does not believe the malady is the same as Brill's disease, which is now generally supposed to be a form of typhus (*tifo esantematico*).

G. C. L.

Scordo (F.) & Rizzuti (G.). **Considerazioni Cliniche e Ricerche Batteriologiche in una Epidemia d'Ittero Infettivo a Tripoli.** [An Epidemic of Infectious Jaundice in Tripoli in its Clinical and Bacteriological Aspects.] — *Policlinico.* Sez. Med. 1913. Apr. Vol. 20. No. 4. pp. 145-170.

A widespread epidemic of pseudo-catarrhal jaundice which appeared amongst the Italian troops in Tripoli gave the authors the opportunity of conducting certain researches on the etiology of this disease. Blois has already proposed the name of infectious catarrhal jaundice but the authors prefer infectious pseudo-catarrhal jaundice. Chauffard gives the clinical symptoms as follows: Sudden onset, headache, pains in the limbs, trunk, and neck, vertigo, loss of appetite, dirty tongue, nausea or vomiting, insomnia, extreme prostration. There is also fever oscillating from 38·5° C. to 39·5° C., epistaxis, labial herpes (about third or fourth day), bilious diarrhoea more or less prolonged, enlargement of spleen, slight enlargement and pain in liver, with a trace of albumin in the urine. About the fifth or seventh day jaundice appears; there is then a crisis with a fall of temperature and amelioration of the symptoms. The clinical signs found by the authors in their series of 25 cases corresponded closely with those just described. There does not appear to be any record of deaths occurring. Agglutination experiments were made and also bacteriological researches of the blood. A good number of the cases reacted to paratyphoid B. The results of haemocultures were negative as Krohn found in an epidemic of 58 cases, some of considerable gravity. The authors think, however, that the condition is due to a septicaemia of some sort or other, the infection descending by the biliary passages.

G. C. L.

Brault (J.). **Note sur une Forme d'Adénites Subaiguës de l'Aine, rencontrée en Algérie.**—*Bull. Soc. Path. Exot.* 1913. Mar. Vol. 6. No. 3. pp. 201-202.

During twenty years as a surgeon in Algiers, Brault has specially noted a form of subacute adenitis of the groin. Clinically these swellings are typical and they have a special pathological anatomy. Pus occasionally forms and sometimes staphylococci or streptococci are found, but in other instances the collection is absolutely sterile. Inoculation of the pus and pieces of the tissue of the glands into guinea-pigs always gave negative results as regards tubercle, nor did sections of the glands show any evidence of tubercle bacilli or giant cells. Venereal and other causes could also be excluded. [Filariasis is not mentioned as a possible factor, but on the whole the account reads more like climatic bubo than anything else.]

G. C. L.

Bowles (F. H.). **Coccidioidal Granuloma. Report of the Nineteenth Case in California.**—*Jl. Amer. Med. Assoc.* 1912. Dec. 21. Vol. 59. No. 25. p. 2253.

Up to the present time eighteen cases of coccidioidal granuloma have been reported and traced to California. Bowles now describes a nineteenth. Ophüls has described the fungus found in these cases under the name of *Oidium coccidioides,* differentiating it from the closely related *Blastomyces coccidioides* about which much has recently been written.

The duration of the disease is from six months to nine years. Bone lesions seem to be common, some of these having accompanying lesions like hypertrophic lupus. Tumours of the skin followed by ulceration without tendency to heal have also been noted.

The mode of infection, whether external or internal, has not been determined, but in the forms that produce a skin infection as the first symptom the skin is in all probability the primary focus. In internal cases infection is most frequently seen in the lungs. The infection travels by the blood and lymph streams. At autopsy the internal organs are seen to be more or less attacked with lesions similar in distribution to those of tuberculosis.

Most of the previous cases were treated with potassium iodide and surgically. All proved fatal with the exception of one in which the first symptom was a bone lesion of the ankle. In this instance the leg was amputated before other lesions developed and the patient is reported alive and well. The present case occurred in a Japanese farmer who had lived in California since coming from Japan in 1909.

The previous history was negative, venereal diseases being denied. During the year 1910 he was working in the San Joaquin valley as a teamster in a vineyard. In January, 1911, he was taken ill, treated for typhoid fever and was in bed for two months. During the latter part of this time tenderness developed in the right heel with slight swelling. After the fever abated the patient was permitted to be up; the tenderness and swelling remained. During the latter part of March, pain and tenderness developed in the left shoulder and later in the left hip. Work was

resumed, but in a few days he was compelled to stop on account of weakness.

In July the patient first came under observation presenting the following symptoms: He was fairly well nourished with the appearance of being ill, with pain, tenderness and swelling at the crest of the left ilium near the sacro-iliac joint and of the right heel; *x*-rays showing bone destruction in the calcis and ilium. There was slight swelling and tenderness also over the left scapula and over the second and third metacarpal bones of the right hand. Further physical examination proved negative except for slight tenderness along the colon.

Surgery was resorted to, incisions being made along the crest of the ilium and over the os calcis posteriorly; the necrosed bone was curetted and drained. A great deal of pus-like material escaped with the necrotic bone, which at this time gave no growth on agar; smears showed granular material without leucocytes or bacteria. The patient remained in hospital for six months, during which similar lesions gradually developed in the left scapula, right metacarpal bones, lower end of the left humerus and left tibia. These received the same operative treatment but showed no tendency to close in spite of after-treatment. A small nodule next developed on the forehead midway between the hair line and the glabella, which grew to be as large as a hazel-nut without tenderness or tendency to soften, being firmly attached to the bone, but not to the skin. There were occasional slight rises of temperature during the later part of the patient's stay at the hospital.

Cultures made from the lesions were positive, a fungus developing which later was identified by Ophüls as *Oidium coccidioides*. The patient passed from observation in 1912, having left for Japan. He died two months later.

G. C. L.

Mayer (T. F. G.). **A New Mosquito-proof and Storm-proof House for the Tropics.**—*Ann. Trop. Med. & Parasit.* 1913. Mar. 31. Vol. 7. No. 1. pp. 41-44. With 1 plate.

The author has had a house designed for him for use in the tropics, embodying certain principles which he believes are new.

The house, an illustration of which is given, is constructed almost entirely of steel, wood-work being reduced to a minimum. It is built on a plinth of concrete and has a floor and low wall of similar material. The walls are continuous with a steel framing which is filled in completely with mosquito netting made of a specially woven composite material. This netting is sandwiched between perforated metal sheets which prevent bulging and render entry impossible except by the spring doors at each end of the lobby entrances. The roof is completely shut off from the rooms below by an asbestos ceiling. Walls and partitions within the mosquito proofing are done away with in order that any breeze may blow straight through the house from one side to the other. Shutters, provided all round the house, can be shut if the wind be too cold or too strong. The division of the interior of the house is left to the individual occupant; it is suggested that by the use of sun blinds, screens and curtains the open character of the house may be preserved, but permanent brick or stone walls may be built if desired.

It is possible to make such a house of any number of stories and build it on piles if desired.

G. C. L.

Mitzmain (M. B.). *Stomoxys calcitrans*, **Linn. A Note giving a Summary of its Life-History.**—*U.S. Public Health Rep.* 1913. Feb. 21. Vol. 28. No. 8. pp. 345-346.

During the two years' experience as Entomologist to the Bureau of Agriculture in the Philippine Islands the author has specially studied the development and life-history of *Stomoxys calcitrans*. The following is a summary of his study: —

"1. The age at which the female begins egg laying has been determined in bred flies as the ninth day.

"2. The maximum number of eggs produced by a single Stomoxys may be placed at, at least, 632 and possibly 820. As many as 20 depositions are made in the lifetime of a female. The maximum number of eggs deposited at one period was found to be 94.

"3. The incubation period for these eggs is 20 to 26 hours at a temperature of 29° C. to 31° C.

"4. The larval stage under favorable conditions is usually 7 to 8 days.

"5. The imago emerges from the puparium generally in 5 days.

"6. The fly of either sex takes its initial bite in 6 to 8 hours after emergence from the puparium. Flies of this species have been observed to feed experimentally on 17 species of vertebrates including man, reptile, bird, and rodent.

"7. It has been demonstrated that in feeding on live stock Stomoxys probes a wound with its labium from which nonbiting flies draw blood. Surra organisms have been demonstrated in the mouth parts and stomachs of house flies used in experiments in this connection.

"8. In considering the longevity of *Stomoxys calcitrans* it has been determined that a female can live a maximum of at least 72 days and a male a period of 94 days.

"9. The life cycle of calcitrans varies considerably according to the treatment the young forms receive. Under optimum conditions this is a period of 12 days, but under unfavorable surroundings in light and absence of moisture, the life cycle may be extended to 35 days."

G. C. L.

Mesnil (F.). **Maladies Infectieuses et Invertébrés Transmetteurs.**—*Bull. Inst. Pasteur.* 1913. Mar. 15. Vol. 11. No. 5. pp. 185-196; and Mar. 30. No. 6. pp. 233-244.

A very full and interesting resumé of the infectious maladies transmitted by invertebrate hosts. A zoological list of the invertebrates that convey disease is first given, then a review of the infectious maladies carried by insects or other invertebrates, and lastly an account of the invertebrates and the micro-organisms which they convey. Mechanical transmission, hereditary transmission and many other interesting points in connection with the subject are described. A bibliography of 61 papers dealing with the more recent work is given at the end of the paper.

G. C. L.

Book Review.

Minett (F. P.). **Diagnosis of Bacteria and Blood Parasites.** 2nd Edition. Crown 8vo. viii. + 80 pp. 1913. London: Baillière, Tindall & Cox. [2*s.* 6*d.* net.]

A useful little work on the identification of bacteria, their staining reactions, etc. Special reactions—Wassermann's, Widal's, Calmette's, and the opsonic index—are also described. Owing to the great advances made by tropical medicine in the last decade the author has left it to be his duty to incorporate a short summary of the more common blood parasites. To make room for this, without materially increasing the size of the book, many duplicates of staining methods have been deleted.

G. C. L.

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